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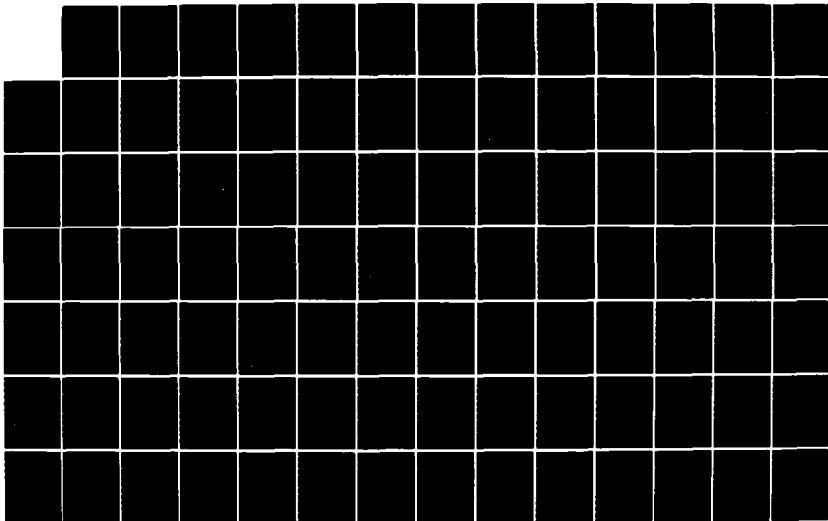
FINAL ENVIRONMENTAL IMPACT STATEMENT FOR OIL REFINERY  
GEORGETOWN SOUTH CAROLINA VOLUME 2(U) CORPS OF  
ENGINEERS CHARLESTON SC CHARLESTON DISTRICT

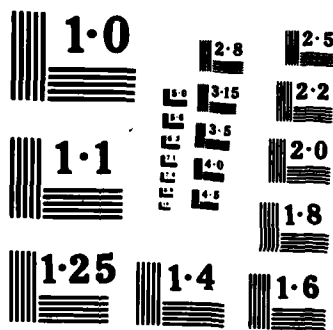
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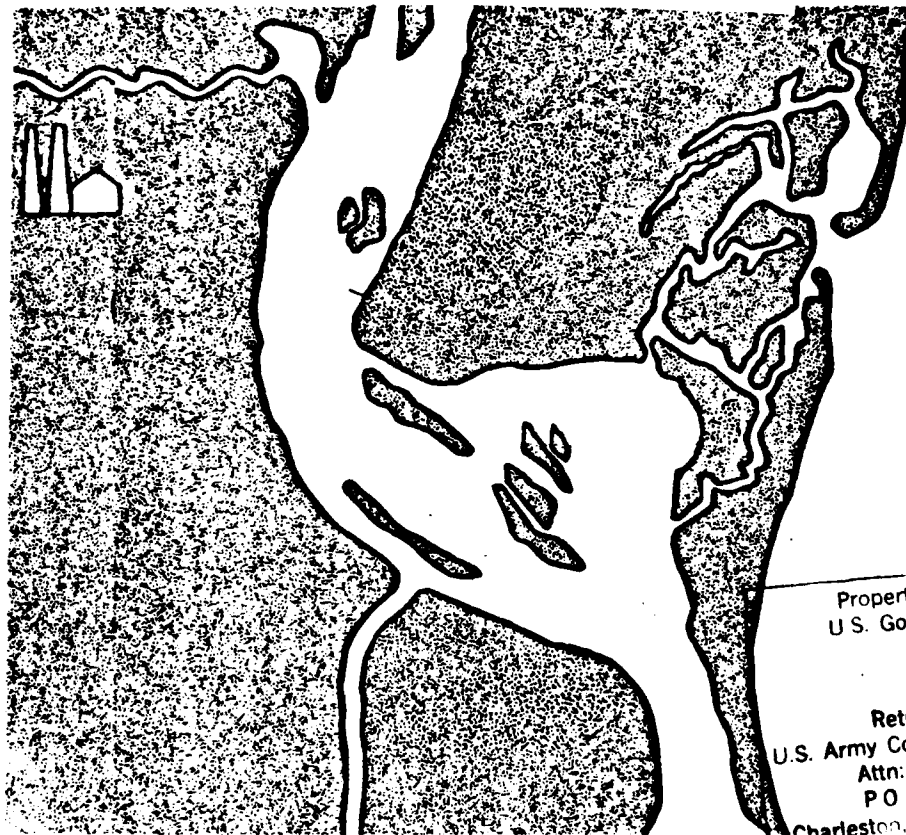




(1)

FINAL  
ENVIRONMENTAL IMPACT STATEMENT  
FOR  
OIL REFINERY  
GEORGETOWN, SOUTH CAROLINA  
VOLUME 2

AD-A152 526



Property of the  
U.S. Government

Return To:  
U.S. Army Corps of Engineers  
Attn: SACASM  
P.O. Box 919  
Charleston, SC 29402-0919

PERMIT APPLICATION  
BY

CAROLINA REFINING AND DISTRIBUTING COMPANY



US Army Corps  
of Engineers  
Charleston District

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APR 9 1985

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Approved for Public Release: Distribution Unlimited SEPTEMBER 1984

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## X. APPENDICES

### APPENDIX A

#### SPILL CONTINGENCY PLAN

In the event of a spill, the following measures will be taken:

1. Eliminate the source of the spill by shutting down equipment, isolating pipe or equipment, or diverting spilled material to containment area.
2. Notify proper authorities.
3. Place physical barriers to halt or slow the spread of oil.
4. Clean-up and recovery.

In the case of spill or the observation of oil on navigable waters, the observer will notify the identified Person Responsible for spill response on his shift; he will also notify the on-shore party to vessel unloading, and pump stations in the refinery.

The Person Responsible will notify appropriate authorities, including:

- National Response Center                      Phone No.: 1-800-424-8802  
    U.S. Coast Guard
- Captain of the Port
- State Authority
- County Authority

Telephone reports will include:

- Name, address, telephone number of person in charge for the Refinery, and the Person Responsible.
- Location of spill.
- Material spilled.
- Estimated quantity.
- Extent of actual or potential pollution.
- Action taken or proposed.

Written reports will also include:

- Date and time of spill.
- Direction, if moving.
- Type of oil spilled, if known.
- Estimate of quantity, duration, and rate of release.
- Conditions: wind, current, wave action, weather.
- Description of area likely to be affected.
- Cause of spill.
- Action.
- Agencies notified.

Response must be immediate and must include inspection of outfalls, and procedures to prevent spread of oil and to remove oil.

(Specific techniques, agencies, contractors, and equipment for spill limitation and clean-up will be developed.)



(Prior to completing Part I, refer to regulations and instructions page 5.)

## SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

### PART I GENERAL INFORMATION

1. Name of facility Carolina Refining & Distributing Company - Georgetown Refinery
2. Type of facility Oil Refinery
3. Location of facility Georgetown, South Carolina

4. Name and address of owner or operator:

Name Carolina Refining & Distributing Company

Address P. O. Box 2582

Chapel Hill, North Carolina 27515

5. Designated person accountable for oil spill prevention at facility:

Name and title \_\_\_\_\_

6. Facility experienced a reportable oil spill event during the twelve months prior to Jan. 10, 1974 (effective date of 40 CFR, Part 112). (If YES, complete Attachment = 1.) \_\_\_\_\_

#### MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Signature \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

#### CERTIFICATION

I hereby certify that I have examined the facility, and being familiar with the provisions of 40 CFR, Part 112, attest that this SPCC Plan has been prepared in accordance with good engineering practices.

\_\_\_\_\_  
Printed Name of Registered Professional Engineer

(Seal)

\_\_\_\_\_  
Signature of Registered Professional Engineer

Date \_\_\_\_\_

Registration No. \_\_\_\_\_ State \_\_\_\_\_

# PART I GENERAL INFORMATION

## 7. Potential Spills — Prediction & Control:

<u>Source</u>	<u>Major Type of Failure</u>	<u>Total Quantity (bbls)</u>	<u>Rate (bbls/hr)</u>	<u>Direction of Flow*</u>	<u>Secondary Containment</u>
Storage Tank	Rupture	100,000	100,000	Diked	100,000 bbl
Vessel Unloading	Leak	100	1,000	Into bay if on vessel; into secondary containment if on shore.	
Truck Unloading	Line Rupture	4	200		8,000 gal.
Tank Car Loading	Line Rupture	4	200		8,000 gal.
Process Equipment	Failure	10	1,000		To oily water sewer.
Process Line	Failure	400	1,250		To oily water sewer.
Vessel Unloading	Line Rupture	*	10,000	Into bay.	

\* Limited by vessel facilities and response.

### Discussion:

Risk of incident in vessel unloading is limited by check valves to prevent backflow and truck and tank car loading is limited by excess flow valves. In addition, operating rules and procedures limit risk.

Risks in tank, equipment, or pipeline failures are very low as a result of design, construction, and inspections. Such failures are exceedingly rare.

All such failures result in spills being directed to a segregated drainage system which is subject to primary treatment prior to discharge.

\_\_\_\_\_  
\*Attach map if appropriate.

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

**PART I  
GENERAL INFORMATION**

[Response to statements should be: YES, NO, or NA (Not Applicable).]

8. Containment or diversionary structures or equipment to prevent oil from reaching navigable waters are practicable. (If NO, complete Attachment #2.) Yes

**9. Inspections and Records**

- A. The required inspections follow written procedures. Yes, WA

- B. The written procedures and a record of inspections, signed by the appropriate supervisor or inspector, are attached. Yes

Discussion: Inspection procedures are generally described in the following. Detailed inspection, operation, and logging procedures will be developed following design of systems used. Operator inspections are not logged; supervisors' or Persons Responsible inspection will be logged and logs maintained by Persons Responsible.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**10. Personnel Training and Spill Prevention Procedures**

- A. Personnel are properly instructed in the following:

- (1) operation and maintenance of equipment to prevent oil discharges, and Yes, WA  
(2) applicable pollution control laws, rules, and regulations. Yes, WA

Describe procedures employed for instruction: New employees are provided with an instruction session covering applicable laws, rules, regulations, and operation and maintenance to prevent spills. Such rules and techniques are reviewed with employees on a regular, periodic basis.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- B. Scheduled prevention briefings for the operating personnel are conducted frequently enough to assure adequate understanding of the SPCC Plan. Yes, WA

Describe briefing program: The purpose and implementation of the SPCC plan are reviewed along with review of specific elements which are dependent on routine operator inspection and on periodic formal inspections. In the event of spills, causes and preventive techniques are modified, if necessary, and reviewed with operating and inspection personnel.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

WA - When appropriate in the development of facility design and staffing.

(Part I) Page 3 of 3

(Prior to completing Part II, Alternate A, refer to regulations and instructions pages 6-7.)

**PART II. ALTERNATE A  
DESIGN AND OPERATING INFORMATION  
ONSHORE FACILITY (EXCLUDING PRODUCTION)**

**A. Facility Drainage**

1. Drainage from diked storage areas is controlled as follows (include operating description of valves, pumps, ejectors, etc. (Note: Flapper-type valves should not be used):  
Diked areas are equipped with storm drain valves which are of manual  
open-and-close design. Condition of retained stormwater is inspected  
and oil is removed by vacuum truck or skimmer. Water is then drained  
by gravity at a controlled rate to the contaminated water drainage  
system. Valves are maintained in the closed position except for  
drainage of oil-free water. Diked areas are regularly inspected.
2. Drainage from undiked areas is controlled as follows (include description of ponds, lagoons, or catchment basins and methods of retaining and returning oil to facility):  
Drainage from undiked processing areas comprising about 4.0 acres is  
collected in a contaminated water drainage system which discharges into  
a pond having a capacity of 7 acre-feet and excess capacity for spill  
containment of 2 acre-feet. A baffle at the outlet of the pond prevents  
oil outflow and oil is recovered by vacuum truck. During low flow conditions  
water is pumped from the pond to secondary treatment. During storm  
conditions, excess is discharged.
3. The procedure for supervising the drainage of rain water from secondary containment into a storm drain or an open watercourse is as follows (include description of (a) inspection for pollutants, and (b) method of valving security). (A record of inspection and drainage events is to be maintained on a form similar to Attachment #3):  
Secondary containment areas are routinely inspected as a part of  
operating activities. If oil is detected visually, the responsible  
supervisor will determine the quantity and specify appropriate action:  
remove by vacuum truck or skimmer, remove with adsorption medium, or  
drain to contaminated water system. Water will be drained to the  
contaminated water system under controlled conditions by periodic  
monitoring of flow rate and adjustment of valve. Operating procedures  
and work rules cover valve operation and visual inspection will confirm  
that valve operation is correct.

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

A-5

(Part II, Alternate A) Page 1 of 51



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PART II. ALTERNATE A  
DESIGN AND OPERATING INFORMATION  
ONSHORE FACILITY (EXCLUDING PRODUCTION)

[Response to statements should be: YES, NO, or NA (Not Applicable).]

**B. Bulk Storage Tanks**

1. Describe tank design, materials of construction, fail-safe engineering features, and if needed, corrosion protection: Tanks are of welded steel construction in accordance with API-650 or 620. Tanks are equipped with fast response liquid level gauges which are indicated at gauging and pumping stations. Radio and telephone communication exists between gaugers and pumping stations or vessels.
2. Describe secondary containment design, construction materials, and volume: Secondary containment is by earth dikes surrounding individual tanks or groups of tanks. The dike volume is sufficient to contain the contents of the largest enclosed tank plus excess for rainwater.
3. Describe tank inspection methods, procedures, and record keeping: Tanks are visually inspected at frequent intervals by operating personnel for leakage and for accumulations of oil and water in diked areas. A periodic inspection is conducted, and records kept, showing results of detailed visual inspections followed, if considered necessary, by thickness gauging.
4. Internal heating coil leakage is controlled by one or more of the following control factors:
  - (a) Monitoring the steam return or exhaust lines for oil. Describe monitoring procedure:
  - (b) Passing the steam return or exhaust lines through a settling tank, skimmer, or other separation system. Yes
  - (c) Installing external heating systems.
5. Disposal facilities for plant effluents discharged into navigable waters are observed frequently for indication of possible upsets which may cause an oil spill event.  
Describe method and frequency of observations: Outfalls are visually observed by operators on a daily basis as part of routine job duties. Temperature and flow of outfalls are monitored periodically. A periodic visual inspection is conducted, with lab analysis of samples for pollutants and pH. Records of periodic analyses are maintained.

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

PART II, ALTERNATE A  
DESIGN AND OPERATING INFORMATION  
ONSHORE FACILITY (EXCLUDING PRODUCTION)

[Response to statements should be: YES, NO, or NA (Not Applicable).]

C. Facility Transfer Operations, Pumping, and In-plant Process

1. Corrosion protection for buried pipelines:

- (a) Pipelines are wrapped and coated to reduce corrosion. Yes  
(b) Cathodic protection is provided for pipelines if determined necessary by electrolytic testing. Yes  
(c) When a pipeline section is exposed, it is examined and corrective action taken as necessary. Yes

2. Pipeline terminal connections are capped or blank-flanged and marked if the pipeline is not in service or on standby service for extended periods. Yes  
Describe criteria for determining when to cap or blank-flange: Any line in process service carrying oil or liquid product is capped, blinded, or isolated by valves if it is used only for occasional service.

3. Pipe supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. Yes  
Describe pipe support design: Pipe supports are isolated from pipe by shoes or rollers if pipe is subject to movement. Lines which are expected to expand are equipped with expansion joints or loops and clamped at appropriate locations.

4. Describe procedures for regularly examining all above-ground valves and pipelines (including flange joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces): Pipe lines are visually examined (including valves, flanges, etc.) frequently by operators as part of their routine duties. Corrective action is taken immediately on discovery of leaks.

5. Describe procedures for warning vehicles entering the facility to avoid damaging above-ground piping: Above ground piping is designed to minimize exposure to vehicles. Horizontal and vertical clearances are marked at the entrance to any restricted roadway or equipment-way, and operators of vehicles are instructed in potential hazards. In-plant speed limit is 10 mph.

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

PART II, ALTERNATE A  
DESIGN AND OPERATING INFORMATION  
ONSHORE FACILITY (EXCLUDING PRODUCTION)

[Response to statements should be: YES, NO, or NA (Not Applicable).]

D. Facility Tank Car & Tank Truck Loading/Unloading Rack

Tank car and tank truck loading/unloading occurs at the facility. (If YES, complete 1 through 5 below.)

Yes

1. Loading/unloading procedures meet the minimum requirements and regulations of the Department of Transportation.

Yes

2. The unloading area has a quick drainage system.

Yes

3. The containment system will hold the maximum capacity of any single compartment of a tank truck loaded/unloaded in the plant.

Yes

Describe containment system design, construction materials, and volume:

Truck loading area is curbed and drained to sumps which can be pumped out or drained to contaminated sewer system. Tank car areas are similarly handled. Loading areas and sumps are of concrete, and are designed to contain 12,000 gallons. Loading and unloading is through top entering connections wherever possible. Vessel unloading area is diked where vessel-to-shore connections are made. Continuous communication between vessel and shore by radio is maintained and shore lines are equipped with check valves to prevent accidental backflow.

4. An interlocked warning light, a physical barrier system, or warning signs are provided in loading/unloading areas to prevent vehicular departure before disconnect of transfer lines.

Yes

Describe methods, procedures, and/or equipment used to prevent premature vehicular departure: Warning signs are located in tank car and truck loading/unloading areas. Operating procedures required chocking of wheels prior to loading and use of a grounding interlock for truck loading.

Vessels are monitored by their crews and are also monitored from ashore. Continuous communication between shore and vessel is maintained.

5. Drains and outlets on tank trucks and tank cars are checked for leakage before loading/unloading or departure.

Yes

Name of facility \_\_\_\_\_

Operator \_\_\_\_\_

PART II, ALTERNATE A  
DESIGN AND OPERATING INFORMATION  
ONSHORE FACILITY (EXCLUDING PRODUCTION)

[Response to statements should be: YES, NO, or NA (Not Applicable).]

E. Security

1. Plants handling, processing, or storing oil are fenced. Yes
2. Entrance gates are locked and/or guarded when the plant is unattended or not in production. Yes
3. Any valves which permit direct outward flow of a tank's contents are locked closed when in non-operating or standby status. Yes
4. Starter controls on all oil pumps in non-operating or standby status are:  
(a) locked in the off position;  
(b) located at site accessible only to authorized personnel. Yes

5. Discussion of items 1 through 4 as appropriate: \_\_\_\_\_  
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6. Discussion of the lighting around the facility: Lighting is adequate to easily identify any significant leakage at any time of night. Lights are so located that most tank and equipment surfaces will receive some illumination. Operators are equipped with flashlights if closer inspection is required. Truck or tank car loading/unloading areas are for daytime use only.  
\_\_\_\_\_  
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Name of facility: \_\_\_\_\_

Operator: \_\_\_\_\_



# APPENDIX B

## COMMENT ON THE DRAFT EIS AND THE CORPS' RESPONSES

<u>Designation</u>	<u>Organization or Individual</u>	<u>Page</u>
AA	U.S. Forest Service	B-002
AB	Federal Highway Administration	B-003
AC	U.S. Environmental Protection Agency	B-004
AD	Advisory Council on Historic Preservation	B-010
AE	U.S. Department of the Interior	B-011
AF	National Oceanic and Atmospheric Administration	B-015
AG	U.S. Coast Guard	B-034
AH	U.S. Geological Survey	B-035
AI	S.C. Water Resources Commission	B-037
AJ	S.C. Wildlife & Marine Resources Department	B-043
AK	S.C. Department of Archives and History	B-049
AL	State of South Carolina, Office of the Governor	B-052
AM	S.C. Department of Health and Environmental Control	B-056
AN	S.C. Department of Highways and Public Transportation	B-059
AO	University of South Carolina, Belle W. Baruch Laboratory	B-060
AR	Eugene C. Brickley, Jr., for several parties	B-063
AS	Santee Preservation Society	B-111
AT	Yawkey Foundation	B-113
AU	South Carolina Wildlife Federation	B-116
AV	John R. Clark for clients	B-121
AW	Sierra Club	B-126
AX	National Wildlife Federation	B-134
AY	National Wildlife Federation	B-141
AZ	National Audubon Society	B-153
BA	Ford, Bacon & Davis	B-154
BB	Ford, Bacon & Davis	B-160
BC	G. William De Sousa	B-180
BD	William K. Michener	B-181
BE	Thomas J. Rubillo	B-183
BF	Samuel P. Savage, Ph.D.	B-184
BG	Wendy Allen	B-186
BH	Michael B. Prevost	B-187
BI	Dennis M. Allen, Ph.D.	B-189
BJ	William J. Clark	B-191
BK	Steve T. Everhart	B-194
BL	George R. Geer, Jr.	B-196
BM	Research Planning Institute, Inc.	B-197
BN	Peter Frederick	B-200



United States  
Department of  
Agriculture

Forest  
Service

Francis Marion &  
Sumter NPs

1835 Assembly Street  
P. O. Box 2227  
Columbia, SC 29202

Reply to

1950 Forest Service NEPA Process

Date May 24, 1984

Subject

Draft EIS for Proposed Oil Refinery, Georgetown, SC

To

District Engineer  
U. S. Army Engineer District, Charleston  
ATTN: SACEN-E  
P. O. Box 919  
Charleston, SC 29402

A review of the DEIS for the proposed oil refinery in Georgetown did not reveal any adverse effects to the Francis Marion National Forest.

An error in the DEIS was found on page VI.B-12 in the description of areas sensitive to air quality. The four wilderness areas on the Francis Marion National Forest were omitted. A copy of the page with pen and ink corrections is attached.

AA-1

Page VI.F-12 has been revised to include the suggested information.

DAVID V. ROSDAHL  
Soil-Water and LMP Staff Officer

Enclosure

62  
1-73





U.S. Department  
of Transportation  
Federal Highway  
Administration

South Carolina Division Office

1835 Assembly Street  
Suite 758  
Columbia, South Carolina 29201

April 18, 1984

BY MAIL, V. J. JAMES TO:  
HA-SC

Mr. John L. Carothers  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, S.C. 29402

Dear Mr. Carothers:

This is to advise that we have reviewed the Draft Environmental Impact Statement for the proposed oil refinery in Georgetown, South Carolina and offer the following comment for your consideration:

It is noted that suspension of the proposed pipeline from the US 17 bridge over the Sampit River is considered as an alternate. As stated, this would require an encroachment permit from the South Carolina Department of Highways and Public Transportation. Also, as stated in the Draft EIS, the impacts of this alternate and the underwater alternate are essentially the same. It is suggested that the USCE secure comment from the South Carolina Department of Highways and Public Transportation concerning suspension of the pipe from the US 17 bridge.

Sincerely yours,

B. G. Cloyd  
Division Administrator

*B. G. Cloyd*  
By B. G. Cloyd  
District Engineer

The Corps has requested comments from State agencies through the State Clearinghouse in the Office of the Governor according to the procedure established by the State.

AB-1

B-3



## REGION IV

308 COURTLAND STREET  
ATLANTA, GEORGIA 30303

MAY 29 1984

**4 PM-BA/CMH**

LTC F. F. Lee Smith, Jr., 1945-1948.  
District Engineer  
U.S. Army Corps of Engineers, Charleston, S.C.  
P.O. Box 919  
Charleston, South Carolina 29402

Dear Colonel Smith:

As a cooperating agency and pursuant to Section 309 of the Clean Air Act, EPA has reviewed the Draft Environmental Impact Statement (EIS) concerning the proposed oil refinery in Georgetown County at Georgetown, South Carolina. Our main concerns with this prospective project are the risks associated with oil spills in Winyah Bay and the environmental consequences of petrochemical discharges during refinery operation. EPA believes that any significant increase in risk to this nationally significant estuarine system is unsatisfactory. While EPA appreciates the generic need for new refineries in environmentally-acceptable areas, we believe that the selected site is not environmentally acceptable and other less sensitive sites can satisfy national and regional needs.

EPA believes that Winyah Bay is unique, relatively unspoiled, and is the only estuarine site (North Inlet) in the United States used for the National Science Foundation's Long-Term Ecological Research program. The unique nature of the Bay, the risks associated with the increased oil volume (approximately 838 percent) transported through the Bay and the corresponding increased risk in oil spills, and the presence of existing wastewater discharges have caused EPA to rate this proposed project as EU-1, i.e., the refinery site described in the Draft EIS is Environmentally Unsatisfactory to EPA. In addition, we are concerned that the secondary impacts resulting from the project such as transportation corridors, increased housing, noise, and fugitive dust will all further contribute to the environmental

[illegible]

**Concerns noted.**

degradation of the region and the marine resources of the estuarine system. We wish to go on record as indicating that unless the location of this facility is changed, we will consider it as a candidate for referral to the Council on Environmental Quality for resolution of this matter. To support our Agency position, we have enclosed a list of "Special Concerns" regarding this Draft EIS.

Our concerns, quite clearly, relate to the potential adverse environmental impacts that could result to sensitive resources in the Winyah Bay area and not specifically to the construction of a refinery. If the applicant could locate a more acceptable site with less damaging environmental impacts, we would be pleased to work closely with you, the applicant, and other regulatory agencies in an effort to satisfy regional energy needs.

We appreciate the opportunity to review the Draft EIS and to participate as a cooperating agency.

Sincerely yours,

  
Charles R. Jeter  
Regional Administrator

Enclosure: Special Concerns

cc: U.S. Fish and Wildlife Service  
Ecological Services  
P.O. Box 12557  
217 Ft. Johnson Road  
Charleston, South Carolina 29412

National Marine Fisheries Service  
Pivers Island  
P.O. Box 570  
Beaufort, North Carolina 28516

### SPECIAL CONCERNS

- Winyah Bay is one of the largest estuaries in the Southeast with characteristics that make it unique and irreplaceable. Few other estuaries are as extensively bordered by undeveloped marshes. More than 31,000 acres of fresh, brackish, and salt marshes occur in the area. No other estuary on the East Coast is surrounded with as much land and water areas that are set aside, in perpetuity, for the purposes of research, education, and conservation. Over 60,000 acres adjacent to the Bay, including the Santee Coastal Reserve, the Yawkey Wildlife Center, and the Hobcaw Barony (Baruch Foundation), fall into these categories. Research done by the Baruch Foundation is of national significance. Due to the relatively unspoiled nature of the Bay's North Inlet estuarine subsystem, it is the only estuarine site in the United States funded for study under the National Science Foundation's Long-Term Ecological Research Program. As described in the Draft EIS, Winyah Bay also supports valuable commercial (pg. VI. D-27) and recreational (pg. VI. D-29) fisheries as well as several endangered species (pg. VI. D-36). The total wholesale value of the commercial landings in Georgetown County was \$3,285,017 in 1979, of which \$2,853,491 was contributed by estuarine-dependent species.

AC-2

The Draft EIS concluded that as long as oil is transported through Winyah Bay, oil spills will occur and will degrade the Sampit River and Winyah Bay ecosystem. Also, the chronic discharge of petrochemicals would persist and accumulate in the aquatic environment and contribute to this degradation. The Charleston District indicated on page V.7 (Comparison of Alternatives) of the Draft EIS that it "does not concur with the significance attributed to some impacts" presented by EPA and the U.S. Fish and Wildlife Service. EPA was unaware of this position by the Charleston District until publication of the Draft EIS. The primary reasons for the District's difference of opinion are listed on page V.7 as:

1. The findings of various State agencies as evidenced by permits and certifications
2. Projected effects of refinery operation
3. Spill probabilities

EPA's responses to these factors are presented below.

Page V.7 of the Draft EIS presented the Charleston District's determination regarding the significance of impacts of the proposed refinery and the basis therefore. Many of the comments received challenged the appropriateness of this portion of the DEIS. Such information was not presented for the purpose of undermining the information provided by the cooperating agencies; however, to avoid any possibility of such a result the information has been deleted.

Additionally Table V.I has been revised to reflect impacts identified in the DEIS but not addressed in the table. This table is presented for purposes of comparison of comparison and summary. Detailed information regarding impacts is presented in the EIS' analysis of impacts.

• Chronic and acute environmental effects could result from oil spills associated with tanker accidents and oil transfers. Although the Charleston District indicated on page V.7 of the Draft EIS that "large spills are very unlikely," such a possibility exists and would result in significant impacts to the environment. The Charleston District also indicated on page V.7 that "The probability of occurrence of a large spill does not lie within the probable life span of the refinery (approximately 50 years)." This is inconsistent with the text of the Draft EIS which estimates that oil spills could occur within a 50-year span (pg. VII, B-42; Table VII, B-13). In addition, even if the probability of a spill in Winyah Bay were found to be greater than 50 years, it does not follow that no spills would occur during the 50-year life span of the proposed refinery. Probabilities are based on statistical occurrences over a general time frame rather than actual occurrences during a specific period within that time frame. A spill, however unlikely, could therefore occur at anytime during the life expectancy of the refinery, much like a 100-year flood event could occur in two consecutive years. In addition, small oil transfer spills will predictably occur as a consequence of refinery operation.

• The proposed refinery would significantly increase the volume of petroleum transported through the Winyah Bay system. At the present time approximately 1,291,584 barrels per year move through the Bay. The proposed refinery would increase that volume by approximately 10,950,000 barrels per year (838 percent increase) for a total of 12,241,584 barrels per year. The existing movement of barges and tankers carrying petroleum through the Bay is approximately 64 per year. The proposed refinery would add approximately 78 tanker trips per year for a total of 142 trips or 122 percent increase in traffic. Most of the traffic at present is by barges with a volume of around 11,000 to 18,000 barrels with only a few small tankers (90,000 barrels). The proposed refinery would receive almost all of its crude oil in 140,000-barrel tankers which would increase the risk of a major oil spill. In addition, non-petroleum traffic also exists in the Bay and the Intracoastal Waterway which would affect the risk of collisions.

• In the event of an oil spill, the feasibility of an emergency response to control and recover spilled oil would be limited in parts of Winyah Bay. In Mud Bay and similarly shallow areas where oil may be expected to pool, vessels may be unable to operate and deploy containment booms. In areas

where shallow depth is not a problem, currents periodically exceed 1.5 knots, the upper limit above which boom failure can be expected to occur. The shallowness and configuration of the Bay frequently combine to cause wind-induced waves which would inhibit the effectiveness of spill cleanup operations and tend to push oil slicks into bordering marshes. Without effective control and cleanup operations, the cumulative effects of small operational spills and major spills would degrade the existing environment of Winyah Bay.

- An expert in oil spill effects and clean up technology, Dr. Eric Gundlach, has commented on this aspect of the proposed refinery at the Draft EIS public hearing in Georgetown, South Carolina on April 26, 1984. He pointed out that a small refinery operation in Wilmington, North Carolina resulted in a considerable oil spill which caused significant damage to the well-flushed Cape Fear River estuary system. Winyah Bay is not well flushed and spill effects would be expected to be much more damaging.
- The magnitude of the impacts of oil spills would be in excess of the impacts of refinery petrochemical point source discharges since they are controlled through State and Federal regulations. Although refinery discharges would be at concentrations allowable by law, construction of the proposed oil refinery will nevertheless result in the discharge of conventional and non-conventional pollutants into the Sampit River which flows into Winyah Bay. Pollutants entering Winyah Bay will be, at least in part, deposited in shallow, poorly flushed areas such as Mud Bay and the marshes that border approximately 80 percent of the estuary. Therefore, chronic petrochemical discharges, such as those predicted for oil and grease and for certain heavy metals, could result in persistent accumulations that would gradually degrade the existing environment. Some pollutant compounds would likely also bioaccumulate. Very recent (1984) research by the Belle W. Baruch Institute for Marine Biology and Coastal Research ("Pollution Ecology of Winyah Bay, S.C.: Characterization of the Estuary and Potential Impacts of Petroleum") indicated that "The presence of toxic petrochemicals in the refinery effluent, the accumulation of an oily sludge on the bottom, and the reduction of dissolved oxygen levels in the Sampit River will contribute to the degeneration, displacement, or elimination of plant and animal populations in the Sampit River and, eventually, other sections of Winyah Bay."



• The statement made by the Charleston District (pg. V.7 of the Draft EIS) that "The Sampit River and Winyah Bay are now suitable for aquatic life in their present condition" should be taken in the context that the lower Sampit River and upper Winyah Bay are already stressed. The SCDHEC has in fact classified the lower reaches of the Sampit River as "SC", the lowest water quality classification.

• Relative to the permits and certifications, we offer the following comments:

1. The PSD Permit issued in 1979 has now expired and will require a comprehensive analysis by SCDHEC for consideration of reissuance.
2. The 401 Water Quality Certification only considered the effects of oil pipeline stream crossing, not the total refinery operation and associated point source discharges.
3. The Coastal Council certification was conditioned to require a more detailed environmental analysis.
4. The final NPDES permit has yet to be issued.

Environmental permits, therefore, have either not been issued, are expired, are incomplete, or are conditioned.

**Advisory  
Council On  
Historic  
Preservation**

The Old Post Office Building  
1100 Pennsylvania Avenue, NW, #809  
Washington, DC 20004

**APR 18 1984**

Lt. Colonel F.L. Smith, Jr.  
District Engineer  
Charleston District  
Army Corps of Engineers  
P.O. Box 919  
Charleston, SC 29402

REF: Proposed Permit for Carolina Refining and Distributing Company Oil  
Refinery, Georgetown County, South Carolina

Dear Colonel Smith:

We have received and reviewed the Draft Environmental Impact Statement (DEIS) for the referenced permit application. While three archeological sites have been identified to date within the proposed permit area, all of them along the Sampit River, the DEIS states that the area along the river "has a high potential for containing more" (DEIS, VII.G-1).

Based on this preliminary assessment, a more intensive archeological survey to identify and evaluate any other archeological sites in the area, as well as to assess the effects of the pipeline route and refinery siting and construction on these resources, would be necessary prior to a decision to grant the permit. The Corps should consult with the South Carolina State Historic Preservation Officer, and follow any remaining steps necessary to comply with Section 106 of the National Historic Preservation Act and the Council's regulations (36 CFR Part 800).

Thank you. Staff Archeologist Ronald D. Anzalone can be contacted at 202-786-0505 (an FTS number).

*[Signature]*  
Ronald D. Klima  
Chief, Eastern Division  
of Project Review

AD-1

Section F. on page VII.G-1 has been clarified to show that neither the refinery nor the pipeline should affect any cultural resources. See also the responses to comments AK-1 through AK-4 of the S.C. State Historic Preservation Officer regarding the lack of project impact to cultural resources.



## United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

MAY 31 1984

EE-94/493

District Engineer  
U.S. Army Engineer District, Charleston  
ATTN: SACEN-E  
Post Office Box 919  
Charleston, South Carolina 29402

Dear Sir:

Thank you for your letter of April 4, 1984, transmitting copies of the draft environmental impact statement for an Oil Refinery in Georgetown County, South Carolina. The Department of the Interior has reviewed the draft statement. Our comments are presented according to the format of the statement or by subject.

### GENERAL

Within the limits of information available at the time of preparation, the draft statement clearly and accurately addresses baseline water quality and fish and wildlife resources conditions. With the exception of certain information presented on page V.7 and Table V.1 that we believe may be unsubstantiated and appears to be contradictory, the statement also clearly addresses anticipated impacts to water quality and fish and wildlife resources arising from potential oil spills and chronic discharges associated with refinery operation.

### Comparison of Alternatives

The information contained in Table V.1 with respect to impact determinations does not agree with those projections substantiated throughout the rest of the draft statement. We believe the three major factors on page V.7 supporting Table V.1's impact analysis do not override the detailed analyses performed by the cooperating agencies in arriving at their impact conclusions.

We believe issuance of State permits and certifications is not a justifiable rationale for assigning minor adverse impacts to fish and wildlife resources, particularly in that these agencies made their permitting and certification decisions in the absence of the information contained in this draft statement. The South Carolina Coastal Council recognized the absence of information by conditioning its certification to require a more detailed environmental analysis. The referenced State air emissions permit is no longer valid and the referenced NPDES permit has not been issued. Contrary to the statement in (b) on page V.7 that the issued South Carolina Department of Health and Environmental Control (SCDHEC) 401 Water Quality Certification "... certifies that the refinery should not contravene any State water quality standards," discussions with SCDHEC personnel indicate that this certification only considered the effects of the pipeline crossing. It did not consider the input of chronic pollutants through point source discharges associated with refinery operation. These water quality issues will be considered in deliberations on the NPDES permit.

Table V.1 has been revised to reflect impacts identified in the DEIS but not addressed in the table. See the response to comment AC-2 regarding the deletion of material on page V.7.

AE-1

We do not agree with the statement shown on page V.7 which indicates that, "since biological productivity is maintained under existing discharges, the increment of pollutants from the proposed refinery does not appear significant." No data are presented to support this conclusion. In fact, as clearly presented in other sections of the document, the upper portion of Winyah Bay is biologically stressed by existing industrial discharges. A recent study on the status of anadromous fish in the southeastern United States (Rulison et al. 1982) specifically reported on the decline in the anadromous fishery in Winyah Bay due to pollution.

AE-2

There is also no evidence that the 9.3 percent increase in mass loading of oil and grease and projected increases in other pollutant loading would not prove significant in terms of long-term chronic effects on the biota of the Winyah Bay/Sampit River system. Conversely, other sections of the document project increases in ultimate ambient concentrations of oil and grease arising from this mass loading increase that vary from 60 to over 2,000 percent, bringing projected ambient levels into a range known to cause chronic, sublethal effects on biological organisms (see Table VII. C-1). In addition, predicted long-term adverse impacts to biota due to chronic incorporation of pollutants into the sediments as documented in other sections of the draft statement are not addressed.

AE-3

The spill analysis is limited to addressing the probability of occurrence of large spills due to tanker accidents. The final statement should evaluate smaller chronic spills since smaller chronic spills are more likely to be associated with crude and product transfers during daily operations. As detailed in other sections of the draft statement, the cumulative effect of these small chronic spills is anticipated to result in long-term biological degradation of the Winyah Bay/Sampit River through adverse water quality impacts and cumulative incorporation of pollutants in sediments.

AE-4

Therefore, we believe the rationale on page V.7 does not support the impact analysis. In order to maintain consistency in the statement, we strongly recommend that Table V.1 be amended to agree with the impact projections found in the rest of the statement.

AE-5

#### Effects of Plant Operation

The discussion of the oil and grease component of the wastewater effluent should include increases in ultimate ambient concentrations as projected in Tables VII. B-02 and VII. C-1 rather than limiting percentage figures to mass loading. It is such increases in ultimate ambient concentrations that are most critical in the determination of adverse impacts.

AE-6

The statement suggests the possibility of deep-well injection as a means of disposal of industrial waste waters from the proposed refinery on page VII-5. Several considerations in addition to those mentioned should be kept in mind in evaluating this form of disposal as mitigation. First, treatment of the waste water before injection would undoubtedly be necessary. Second, formation fracture gradients should be carefully determined and critical pressures avoided both in testing and operation of any injection wells to avoid fracturing into a fresh-water aquifer. Third, because fresh water is available to considerable depths as noted on pages VI. J-4 and VI. J-5, thorough preliminary exploration should be undertaken; tests should establish the local water-bearing properties of the proposed injection zone; hydraulic isolation of the proposed injection zone should be demonstrated. It may be helpful to examine the records of the part of the

Estimates of the percent increase in mass loading of oil and grease in the Sampit River varied from 5.7 percent (based on New Source Performance Standards calculated from present refinery design data) to 21.8 percent (based on effluent component and treatment values supplied by the applicant). As noted on page VII.B-113 of the FEIS, "It is expected that most oil and grease components of the wastewater would sorb to suspended particles in the vicinity of the outfall and settle into the sediments. This process would create a large cumulative impact to river, and subsequently bay, sediments over time." The values given in Table VII.C-1 and VII.B-12 in the DEIS with regard to ultimate ambient concentrations have been deleted in the FEIS since retention in the water column would be limited for many of the effluent components, including oil and grease (see revisions to FEIS pages VII.B-26 through VII.B-31a).

Two relatively small operational spills that may be considered chronic (estimated probability of return of one year or less) have been included as Cases 3 and 4 in the oil spill scenario section. Smaller handling losses at Pier 31 would behave comparably to the two modeled cases, given similar conditions at the time of the spills. Other handling losses on refinery property or along pipelines would not lend themselves to analysis by the May oil spill trajectory model. It is felt that these small chronic spills are adequately addressed in the section entitled "Runoff and Small Unavoidable Handling Losses," presented on pages VII.B-34 through VII.B-36.

See the response to comment AE-1

A revision of Table VII.B-12 and textual changes to the discussion on impacts of the refinery wastewater delete specific values for component concentrations. This is due to the lack of quantitative information on degradation characteristics of the various components. Therefore cumulative impacts to water quality in the Sampit River can be best presented by comparison of potential mass loadings from the refinery rather than ultimate concentrations of various pollutants throughout the receiving waters.

The discussion of deep well injection of wastewater on page VII-5 has been expanded to address concerns expressed in this comment.

Cretaceous Black Creek Formation near Wilmington, North Carolina (Warner, Don L., 1972, Survey of Industrial Waste-Injection Wells: U.S. Geological Survey Contract No. 14-98-0001-12280, vol. 2, North Carolina Board of Air and Water Resources Permit No. 1395, 8 pages). If injection into fractured bedrock should be considered, regional stress patterns, tectonics and geologic structure should be carefully examined to evaluate the possibility of induced seismicity.

#### Land-Use Changes

The discussion of land-use on page VII. V-1 should be expanded beyond the refinery site to address potential secondary land-use changes in the Winyah Bay area that may occur in light of projected water quality and sediment degradation from chronic waste water discharges and potential oil spills as discussed in other sections of the document (e.g., changes in commercial and recreational fisheries use, research and conservation land uses). At a minimum, Section VII. C-4 (pages VII. C-48 to VII. C-50), which includes such discussion of secondary impacts to land-use, should be referenced.

AE-7

#### Employment and Income

The discussion of employment and income if the project is approved should compare the potential gains in these factors from refinery employment with potential losses due to the projected degradation of the Winyah Bay/Sampit River system from chronic and accidental (spills) discharges of pollutants. The economic loss category should include commercial fisheries and water-associated research and conservation management opportunities.

AE-8

#### CONCLUSIONS

Analyses by the U.S. Fish and Wildlife Service have shown that the proposed refinery would adversely impact the nationally significant fish and wildlife resources of the Winyah Bay/Sampit River system, including threatened and endangered species, species of special emphasis and anadromous fish, through chronic inputs of pollutants or major oil spills. We believe that Table V.1 and pages V.7 in the final statement should more accurately reflect the anticipated impacts from the proposed refinery that are presented in other sections in the draft statement.

AE-9

We believe that the permitting of this project would cause long-term unavoidable adverse impacts to the Winyah Bay/Sampit River system solely from chronic proposed waste water discharges and small unavoidable handling losses. These impacts would occur without any major oil spills. It also is evident from information in the document that the Winyah Bay system is unique and irreplaceable. Its abundant resources are of national significance. Based on the resources and impacts detailed in the draft statement, the proposed refinery appears to be incompatible with maintaining the ecological integrity, existing uses and abundant fish and wildlife resources of the Winyah Bay system.

B-13

There is no page VII.V-1, but land-use changes at the refinery site are addressed on page VII.D-1. The suggested reference to land-use changes on pages VII.C-48 through 50 has been added to page VII.D-1.

The potential loss identified has not been specifically quantified. It may result from either a spill or chronic discharge. The spill probability analysis section addresses the impact on aquatic habitat and water quality from which one can draw conclusions regarding the impacts on fishing and recreation. Too many variables exist to specifically quantify the impact of any given spill although an adverse impact would result. Chronic discharges should not significantly impair fishing or recreation given the provisions for maintaining existing uses imposed by regulation of the discharge pursuant to the required NPDES permit. One of the specific uses to be protected in Class SC waters is the propagation and survival of marine life. By definition, SC waters are suitable for such purposes. However, information addressing the potential impact of the refinery on aquatic resources has been added to page VII.D-2.

Comments are noted.

District Engineer

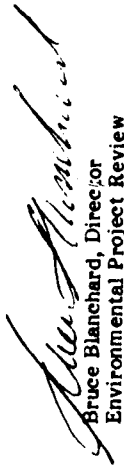
4

Of the alternatives presented in the draft statement, the only two that appear to be compatible with maintaining the ecological integrity of the area are permit denial (no action) and building of a larger refinery at Savannah, Georgia. In that this latter alternative would require further detailed analysis to discern impacts on the environment and that it has been previously dismissed as not meeting the applicant's needs, the environmentally preferable alternative is that of permit denial.

Therefore, should the final environmental statement continue to downplay the significant impacts projected by the majority of the document and/or reflect the a preferred alternative that would significantly impact the nationally important resources of the Winyah Bay system, we consider this project a candidate for referral to the Council on Environmental Quality, pursuant to 40 CFR 1504.

We hope these comments will be helpful to you.

Sincerely,



Bruce Blanchard, Director  
Environmental Project Review



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

June 6, 1984

Lieutenant Colonel F. L. Smith  
District Engineer, Charleston District  
Department of the Army, Corps of Engineers  
P.O. Box 919  
Charleston, SC 29402

Dear Colonel Smith:

The National Oceanic and Atmospheric Administration (NOAA) has reviewed the Draft Environmental Impact Statement (DEIS) on the permit application by Carolina Refining and Distributing Company. Our comments are enclosed.

We are concerned that Section V. (Alternatives) prepared by the Corps of Engineers appears to contradict sections of the DEIS prepared by the Environmental Protection Agency and the U.S. Fish and Wildlife Service on water quality, air quality and fish and wildlife resources. Our analysis of impacts to marine and estuarine resources supports the Fish and Wildlife Service assessment. In addition to our reservations on the DEIS, we note that the National Marine Fisheries Service Biological Opinion (July 8, 1982) states that the project is likely to jeopardize the continued existence of the southern population of shortnose sturgeon, an endangered species.

We recommend that the Corps of Engineers deny the permit to Carolina Refining and Distributing Company, unless the Corps can assure that the project is not likely to jeopardize the continued existence of the shortnose sturgeon. Should the Corps decide to issue this permit without resolving this issue, NOAA will consider asking the Secretary of Commerce to refer this decision to the Council on Environmental Quality.

Sincerely,

*Joyce H. Wood*  
Joyce H. Wood  
Chief, Ecology and  
Conservation Division

Enclosure



National Oceanic and Atmospheric Administration  
Comments on Draft Environmental Impact Statement:  
Permit Application by Carolina Refining and Distributing Company  
for an Oil Refinery in Georgetown, South Carolina

The National Oceanic and Atmospheric Administration (NOAA) has reviewed the above Draft Environmental Impact Statement (DEIS) and offers the following comments. These comments represent the views of the following NOAA agencies: the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS).

#### GENERAL COMMENTS

Corps of Engineers Assessment of Project Impacts. Various federal agencies with responsibility for protecting water quality, fish, and wildlife wrote sections of the DEIS for which they have expertise. These sections, which NOAA considers accurate, provide detailed assessments of potential adverse impacts on living resources. The Corps should provide a stronger basis for its assessment (in the section labeled "Comparison of Alternatives") that the description of potential adverse impacts provided by these agencies is inaccurate or overstated. In addition, the Corps should conduct its own thorough analysis of effects of the project, instead of relying on the issuance of permits by other agencies to show that project effects are acceptable.

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revision of Table V.1.

AF-1

AF-2 Endangered and Threatened Species. The biological opinion (attached) resulting from the consultation between the NMFS and Corps under Section 7 of the Endangered Species Act (ESA) in 1982 concluded that this project was likely to jeopardize the continued existence of the southern population of the shortnose sturgeon. The DEIS documents the importance of Winyah Bay to the southern population of the shortnose sturgeon and outlines the potential impacts of the proposed project on this species. The DEIS does not present data which would cause the NMFS to alter its jeopardy opinion. Under section 7(a)(2) of the Endangered Species Act, the Corps has the obligation to insure that its actions are not likely to jeopardize the continued existence of any endangered species. The Final Environmental Impact Statement should explain how the Corps will insure that the project is not likely to jeopardize the continued existence of the shortnose sturgeon.

B-16

Section 7 consultation requirements on endangered species with the National Marine Fisheries Service (NMFS) have been fulfilled. The Corps recognizes its responsibilities under the Endangered Species Act and will comply with the Act in reaching its decision on the permit application.

If the Army Corps of Engineers has developed new scientific information that would warrant a reexamination of the biological opinion, the NMFS would welcome the opportunity to reinstate consultation.

AF-3 The discussions of project impacts on endangered/threatened species are adequate for those species addressed, i.e., loggerhead sea turtle (*Caretta caretta*) and shortnose sturgeon (*Acipenser brevirostrum*). However, green sea turtles (*Chelonia mydas*) and Kemp's ridley turtles (*Lepidochelys kempi*) are also known from this project area based on observations and strandings. The discussion in the DEIS should include a description of impacts to these other turtle species.

A discussion of the green sea turtle, Kemp's ridley turtle, and leatherback sea turtle does not appear to be warranted because in its biological opinion, a copy of which is attached to this letter, the National Marine Fisheries Service (NMFS) concludes that these sea turtles seldom approach the shore at Winyah Bay and are not likely to be directly affected by the refinery. The NMFS also notes in its biological opinion that all endangered whales are pelagic species and are unlikely to be affected by the refinery. Since the right whale is specifically covered in the biological opinion, discussion of it in the EIS also appears unwarranted.

The effects of the proposed refinery may also extend offshore based on several of the oil spill scenarios and an increase in ship traffic. Accordingly, marine mammals and the leatherback sea turtle (*Dermochelys coriacea*)



may also be affected. We are especially concerned with effects of an offshore oil spill on or a vessel collision with the right whale (*Eubalaena glacialis*). These whales are frequently found very close to the coast where pairs and females with calves are often sighted only several hundred meters offshore. Since the population of these critically endangered marine mammals only numbers about 200 individuals, avoidable losses of additional individuals may hamper this species survival.

Coastal Zone Consistency. NOAA's National Ocean Service has contacted the South Carolina Coastal Council (SCCC) concerning project consistency with the South Carolina Coastal Zone Management Plan. SCCC found the proposed project to be consistent with its plan and program. NOAA defers to SCCC regarding state coastal zone consistency findings.

#### SPECIFIC COMMENTS

#### V. ALTERNATIVES

AF-4

Page V.7, paragraph 2. The major factors cited by the Corps to support their view of insignificant impacts do not reflect the overall situation regarding state and federal permit status or the best available information concerning impact assessment. Quite the contrary, other sections of the document clearly indicate that the Sampit River and Winyah Bay ecosystem is an extremely important area of national significance and that the siting of the proposed refinery in this area could permanently alter the water quality and habitat values that support important commercial and recreational fishery resources. Additionally, the reasons given by the Corps for disagreeing with analyses elsewhere in the DEIS are based primarily on determinations by other agencies. The Corps presents little evidence that it conducted its own independent evaluation. Without such an evaluation, the Corps' conclusory statements are unsupportable (*Sierra Club v. Corps of Engineers*, 701 F.2d 1011, 2nd Cir. (1983)).

Page V.7, factor 1.b. The issuance of the Section 401 Water Quality Certificate was based solely on an assessment of the impact of the pipeline crossing of the Sampit River. Therefore, it did not consider the impacts associated with construction and operation of the refinery. Also, to date, no National Pollution Discharge Elimination System permit (factor 1.e.) has been issued. Therefore, we believe that it is inappropriate for the Corps to conclude, contrary to the sections of the DEIS written by the Environmental Protection Agency, that the potential adverse impacts on water quality are insignificant.

Page V.7, factor 2. This statement is an oversimplification of a complex problem and is not supported by the data presented in the DEIS. Only gross loading is considered, and no attempt is made to address the cumulative impact of the ultimate ambient concentration of various pollutants. Furthermore, no rationale is provided for the conclusion that a 9.3 percent increase in the rate of discharges of oil and grease is not significant. Other portions of the DEIS (pages VII, C-57 and -58) conclude that the chronic effect of discharges from the Carolina Refining and Distributing Company refinery could result in cumulatively significant, long-term adverse impacts on fishery resources in the Sampit River and Winyah Bay.

An independent analysis of all information presented in the EIS will be conducted by the South Atlantic Division Engineer in making the decision on the permit application. See also the response to comment AF-1.

Page V.7, factor 3. This statement ignores the higher probability of occurrence and effects of small chronic oil spills. Other sections of the DEIS clearly indicate a potential for habitat degradation and overall decline of the Sampit River and Winyah Bay as a result of exposure to small chronic spills.

Page V.8, table. The statements in this table regarding the potential adverse impacts of the proposed refinery are unsupported and inconsistent with the findings in the rest of the document. We recommend that this table either be deleted from the FEIS, or amended to accurately reflect potential adverse impacts which are supported by data presented.

#### VI.C. SURFACE WATER CHARACTERISTICS

Page VI.C-7. The DEIS indicates that the project requires a Section 404 permit under the Clean Water Act. The DEIS should include an analysis of how the project will comply with Section 404(b)(1) guidelines.

#### VI.D. FISH AND WILDLIFE RESOURCES OF THE WINYAH BAY AREA

Page VI.D-36, 8. ENDANGERED SPECIES - Discussions should also be provided for the green sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and right whale. Comments in the above general discussion provide our rationale.

Page VI.D-40, e. Shortnose Sturgeon - Acipenser brevirostrum, paragraph 3. Since shortnose sturgeons are not known to move between river systems, we cannot definitely specify that Cape Hatteras is a boundary for the southern distributional area. Shortnose sturgeons are believed to be extirpated in North Carolina. Accordingly, the southern distributional area may better be described as being between South Carolina and Florida.

#### VII.B. WATER QUALITY

Page VII.B-31. The simulations used to generate the "ultimate ambient concentrations" of contaminants from the refinery effluent (Tables VII.B-12 and VII.C-1) assumed conservative behavior of contaminants. For some constituents, notably oil and grease, this assumption is not valid. Substantial oxidation and biodegradation of petroleum and association with sediments will occur, thus reducing the steady state concentrations well below those predicted. The decreases shown in Tables VII.B-18 to VII.B-21 for oil spills will also occur for similar compounds in the discharged effluent. These decreases should be reflected in the predictions of Table VII.B-12.

Pages VII.B-43-68. Considerable effort went into developing the 16 different "worst case scenarios." Some assessment of the site-specific probabilities of each scenario would be extremely useful. As written, the descriptions of various oil spill scenarios and their potential impacts present significant adverse impacts from each scenario. However, when you compare the statistical analysis of oil spill risks as summarized in Table VII.B-13, you realize that the chance of any one of the 16 scenarios presented is very low. If you could derive the probability that each of the "worst case" scenarios would occur, the presentation would be more objective.

Table V.I has been revised to reflect impacts identified in the DEIS but not addressed in the table.

Dredged or fill material associated with pipelines is permitted on a nationwide basis and does not require the processing of an application. Page VI.C-7 has been corrected to show this.

See the response to comment AF-3.

Information on shortnose sturgeon distributional areas came directly from the NMFS biological opinion. Page VI.D-40 has been amended to accommodate this new information.

The dilution, dispersion and degradation of the proposed refinery wastewater constituents were reassessed so that assumptions of conservatism would not be misleading to the evaluation of impacts from various components. As a result, changes were made to Table VII.B-12 and the discussion in the text regarding the RECELY model and its application to the proposed refinery wastewater. Degradation potentials of the various components were evaluated subjectively. Because degradation needed to be considered and because degradative rates and characteristics of the various components were not well known, a quantitative evaluation such as that originally presented in Table VII.B-12 was not possible.

An indication of the probability of occurrence of oil spills in the Winyah Bay area was presented in the section preceding the described oil spill scenarios. Although not specifically applicable to all conditions postulated for each oil spill scenario, rough estimates could be derived within stated limitations. Accordingly additions to the text were made at the end of the discussion on the oil spill trajectory model and following each of the seventeen oil spill scenarios (see pages VII.B-49 through VII.B-68).

## VII.C. ENVIRONMENTAL CONSEQUENCES ON FISH AND WILDLIFE RESOURCES

AF-1] Page VII.C.14. The presentation of Table VII.C-1 is based on high "ambient concentrations" (see comment on page VII.B.31 above) and low response thresholds. We could not locate all the references in the Table (they are not included in the Literature Cited), but Gilfillan (1973) is misquoted. He found carbon budget interference at oil concentrations of (approximately) 1 ppm, not 100 ppb as stated. More recent and more complete references to sublethal effects are summarized in the current draft report of the National Academy of Science (Oil in the Marine Environment).

AF-2] Page VII.C.16. The concentrations of mercury and zinc as reported in Tables VII.B-12 and VII.C-2 are surprisingly high. It seems unlikely, however, that the Sampit River is a "currently stressed system" (page VII.C-17) from these metals. The potential toxic effects of these metals would be ameliorated by the high concentrations of humic and fulvic acids in the river. Direct comparison of bioassay results (Table VII.C-2) with ambient concentrations (measured or projected) is therefore misleading.

AF-3] Page VII.C.17. The ambient concentration of PCB's in the Sampit River should not be assumed to be zero.

AF-4] Page VII.C-46 and 47. Effects on Endangered Species. Our comments in the above general and specific discussions should be considered in expanding this section.

## VII.D. SOCIO-ECONOMICS.

AF-5] Pages VII.D-1 thru VII.E-1. This section should include a discussion of the socio-economic impacts of a reduction or loss of commercial and recreational fisheries as a result of a major oil spill and/or the chronic discharge of effluents from the proposed refinery. The average landings of over 400 commercial fishermen on approximately 200 fishing vessels were worth in excess of \$1.5 million annually from 1979 through 1982 in Winyah Bay. No dollar value has been established for recreational fishing in Winyah Bay, but this fishery represents an important asset to the local economy. The FEIS should address these potential economic losses.

## CONCLUSION AND RECOMMENDATION

We recommend that the Corps of Engineers deny the permit to Carolina Refining and Distributing Company, unless the Corps can assure that the project is not likely to jeopardize the continued existence of the shortnose sturgeon. Should the Corps decide to issue this permit without resolving this issue, NOAA will consider asking the Secretary of Commerce to refer this decision to the Council on Environmental Quality.

The Literature Cited for Section VII.C. was inadvertently excluded from incorporation with the original DEIS document, but was subsequently circulated to DEIS recipients under separate cover. The Gilfillan (1973) citation has been corrected.

Page VII.C-17 does not state that the Sampit River is a stressed system due solely to mercury and zinc levels. We concur that there are always shortcomings in relating laboratory (bioassay) studies to field situations. However, since there have been no site-specific bioassay studies, we were forced to use literature values as the best available information. The listing of these literature values in Table VII.C-2 is presented as a base of reference rather than a direct comparison.

The referenced statement has been amended.

See the responses to comments AF-3 and AF-9.

The impacts of normal refinery discharges and major oil spills on aquatic resources are discussed in part VII.C. Page VII.D-2 has been revised to recognize the potential economic losses in commercial and recreational fisheries due to refinery effluents and oil spills.

Colonel Bernard E. Stalman  
District Engineer, Charleston District  
Corps of Engineers  
Department of the Army  
P.O. Box 919  
Charleston, South Carolina 29402

Dear Colonel Stalman:

Enclosed is the Biological Opinion prepared by the National Marine Fisheries Service (NMFS) pursuant to Section 7(b) of the Endangered Species Act of 1973 (ESA), as amended, concerning impacts of Carolina Refining and Distributing Company's (CRDC) proposed refinery (P/N 79-5R-319) in Georgetown, South Carolina, on endangered and threatened species. The enclosed opinion is based on information provided by the Corps, a review of the best available scientific and commercial data, and a number of contacts with experts in endangered species.

The National Marine Fisheries Service concludes that the proposed action is not likely to jeopardize the continued existence of threatened and endangered whales and sea turtles. We further conclude that the construction phase of the proposed activity will not significantly impact the endangered shortnose sturgeon. However, we believe that operation of the refinery is likely to jeopardize the population of shortnose sturgeon in Winyah Bay, South Carolina. The only reasonable and prudent alternative we were able to identify to alleviate impacts to shortnose sturgeon is to relocate the refinery to a less sensitive area. The NMFS is prepared to assist the Corps in developing alternate sites by examining impacts to endangered species from proposed projects at those sites.

Please advise us whether you plan to proceed with, modify or forego the subject action. The CRDC or the Corps also has the option to apply for an exemption to Section 7 of the ESA if the Corps decides requirements of the ESA cannot be met. Procedures governing applications for exemptions are found in 50 CFR 431 (1981).

Consultation must be reinstituted if new information reveals a change in the potential impacts of the proposed activity that may affect any listed species or critical habitat; the identified activities are modified in a

manner not considered herein; or a new species is listed or new critical habitat is designated that may be affected by the proposed activity.

This Biological Opinion does not constitute authority to "take" endangered or threatened species. "Take" is defined in Section 3 of the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Any "taking" of endangered or threatened species is prohibited under Section 9(a) of the ESA, 50 CFR, Part 222.21, 50 CFR Part 227.71, and such "takings" are subject to prosecution unless covered by a Section 10(a) of the ESA permit or ESA regulations (for threatened species). Nothing in the Biological Opinion should be construed as authorizing a Section 10(a) permit.

Sincerely yours,

*Bill Stalman*  
William G. Gordon  
Assistant Administrator  
for Fisheries

Enclosure



## ENDANGERED SPECIES ACT OF 1973

## Section 7 Consultation - Biological Opinion

Agency: U.S. Army Corps of Engineers, Charleston District

Activity: Proposal by Carolina Refining and Distributing Company

(CRDC) to construct an oil refinery off Winyah Bay,

near Georgetown, South Carolina (P/N 79-5R-319).

Consultation Conducted By: National Marine Fisheries Service

Date Issued: **JUN 8 1982**

Project Description And Background

This action involves a proposal by Carolina Refining and Distributing Company (CRDC) to construct an oil refinery in Georgetown, Georgetown County, South Carolina. While the refinery would be built on high ground, a pipeline crossing of the Sampit River is necessary to transport crude oil offloaded at the South Carolina State Ports Authority (SCSPA) pier to the refinery and to transport finished product from the refinery to the SCSPA site. Pipeline placement involves burying two 12-in. pipelines in a 6-ft. deep trench dug across the bottom of the Sampit River. The Corps is responsible for permitting the placement of the pipeline pursuant to Section 10 of the River and Harbor Act of 1899 (33 U.S.C. 403).

Crude oil would be transported to the SCSPA pier mainly by 20,000-ton tankers (capable of holding about 3,880,000 gallons of oil). One tanker is

expected to arrive every five days or about 72 ships annually. This would be in addition to the two to three tankers that offload each month at the Hess Oil terminal also located in Winyah Bay. The Hess Oil terminal is utilized solely as an oil storage facility. Some of the finished refinery products (fuel gas, light naphtha, heavy naphtha, kerosene, diesel fuel, coke and sulfur) may be shipped from the SCSPA by barge. However, the bulk of the finished products would be distributed by tanker truck.

Winyah Bay is a wide, shallow estuary about 14 miles long and up to 4 miles wide (Figure 1). The estuary receives a large freshwater inflow from the large drainage basins of the Black, Waccamaw, and Pee Dee Rivers. The Sampit River, where the pipeline would cross, is a coastal river with a small drainage basin that contributes only minor freshwater flow to Winyah Bay (Brownall, 1981).

The mouth of Winyah Bay is partially blocked by Sand Island and flows into and out of the estuary may be swift. Fresh water flows into the estuary may vary from 2000 cubic feet per second (cfs) during dry periods to 100,000 cfs during floods. The salt-water interface (0.5 ppt) extends from the mouth of the Pee Dee River during flows over 35,000 cfs, to as much as 13-16 miles up-river during low flow periods. As much as 1,063,075 cubic yards of sediment may be transported to the estuary each year by fresh-water inflow.

A chronology of events in the consultation process is provided in Attachment 1. By letters of July 25, 1980 and April 21, 1981, the NMFS advised the Corps of the information that would be necessary to prepare a biological assessment pursuant to Section 7 of the Endangered Species Act of 1973 (ESA). The subsequent biological assessment did not contain sufficient

information to ascertain adequately the impacts of CRDC's proposed refinery on endangered shortnose sturgeon and endangered and threatened sea turtles. The Corps was informed of the deficiency and provided a list of information needs in letters of May 21, 1981 and January 13, 1982. By letter of February 19, 1982, the Corps responded to our letters, but did not provide the additional information requested. The District Engineer, Charleston District Corps of Engineers, advised that, "It is my opinion that this office has provided you with as much information as is reasonably available. Therefore, I request that you provide this office with your final biological opinion concerning endangered species within your jurisdiction...."

The NMFS believes that the information requested is vital to understanding fully the status of endangered species in Winyah Bay and the effects the refinery would have on these species. The ESA requires that we use the best scientific and commercial data available in preparing our biological opinion. In view of this requirement we have reviewed all the material provided by the Corps, obtained additional information where possible, consulted the literature, and contacted others with knowledge of endangered species within Winyah Bay and other river systems. The information reviewed, in addition to that listed in our References Section, is provided in Attachment 2.

#### Species Occurring In Project Area

The NMFS believes the project may affect only those listed species occurring in the Winyah Bay estuary and adjacent beaches. Consultation was requested for the endangered and threatened species listed below. No other listed or proposed species for which NMFS is responsible occurs in the project

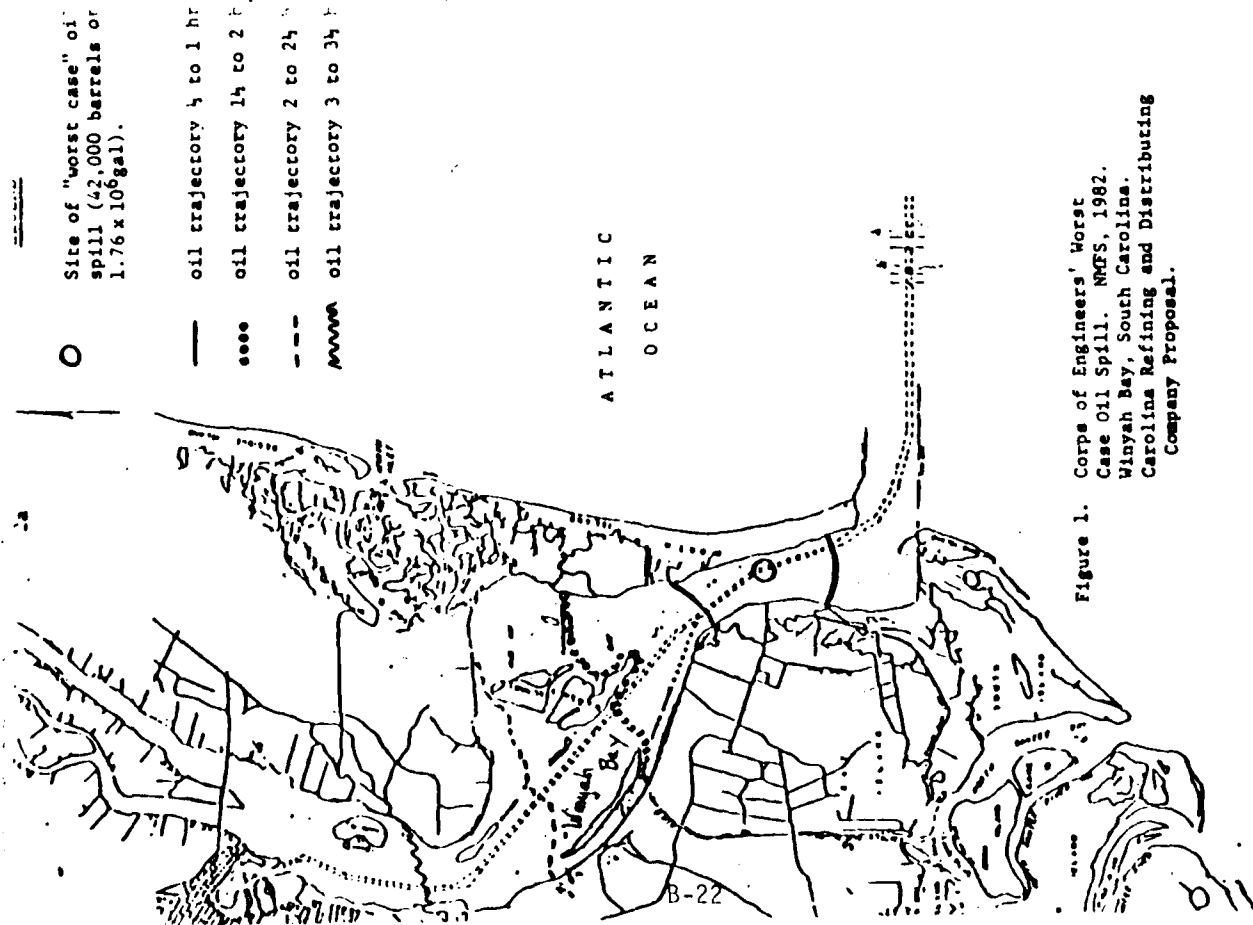


Figure 1. Corps of Engineers' Worst Case Oil Spill. NMFS, 1982. Winyah Bay, South Carolina. Carolina Refining and Distributing Company Proposal.

B. Sea Turtles: The five endangered or threatened species of sea turtles that have been reported in South Carolina waters are as follows:

Leatherback sea turtle. The leatherback is the most pelagic of sea turtles and may often be found near the edge of the continental shelf. In northern waters they occasionally enter shallow estuarine bays. Nesting in the United States is restricted to Florida although one nesting was reported to have occurred in North Carolina in 1966. For nesting or bedding, the leatherback requires a sloping, sandy beach backed up by vegetation. Preferred nesting beaches are mainland and offshore littoral areas with proximity to deep water and generally rough seas. Since this species is unlikely to occur within the Winyah Bay estuary or adjacent beaches, it should not be directly affected by the proposed action.

Hawksbill sea turtle. Hawksbills frequent rocky areas, reefs, shallow coastal areas, lagoons and narrow creeks and passes, but are generally found in water less than 20 meters deep. This species rarely occurs north of Florida (Rebel, 1974) and is unlikely to occur in the project area or to be affected by the identified activities.

Kemp's Ridley sea turtle. This turtle has been reported from as far north as Cape Cod Bay, Massachusetts (Doug Beach, pers. comm.) and strandings have been recorded at both North and Sand Islands at the mouth of Winyah Bay (Sally Hopkins, pers. comm.). Most of the strandings in the project area have involved sub adults. The Kemp's ridley apparently nests mainly at Rancho

area. No critical habitat has been designated in the area. The Corps considered the following endangered species under our purview:

1. Loggerhead sea turtle (Caretta caretta);
2. Kemp's ridley sea turtle (Lepidochelys kempi);
3. Green sea turtle (Chelonia mydas);
4. Hawksbill sea turtle (Eretmochelys imbricata);
5. Leatherback sea turtle (Dermodochelys coriacea);
6. Shortnose sturgeon (Acipenser brevirostrum);
7. Blue whale (Balaenoptera musculus);
8. Finback whale (Balaenoptera physalus);
9. Humpback whale (Megaptera novaeangliae);
10. Right whale (Eubalaena glacialis);
11. Sei whale (Balaenoptera borealis);
12. Sperm whale (Physeter catodon).

#### Biology And Distribution Of Species

A. Whales: All endangered whales that have been reported in the U.S. South Atlantic are pelagic species. Data indicates that these species are most likely to occur off the South Carolina coast and are unlikely to be affected by the identified activity. Therefore, consultation pursuant to Section 7(a)(2) of the ESA is not required for these species and they will not be discussed further in this opinion.

Nuevo, Mexico, but several nestings have been observed at Padre Island, Texas. Most ridleys in South Carolina waters are likely to be sub adults and occur as transients in offshore waters. Since this species also is likely to remain offshore, the NMFS believes it is unlikely to be affected by the proposed action.

Green Sea Turtle. The green sea turtle has a worldwide temperate distribution, preferring shallow waters, inside reefs and areas where marine grasses and algae are plentiful as in shoals, lagoons and bays. Juvenile green sea turtles have stranded along the beaches fronting Winyah Bay and young turtles have been observed in the bay and the area of North Inlet (Sally Hopkins, pers. comm.).

Most nesting of green turtles along the southeast Atlantic occurs in Florida. However, nestings by a single green sea turtle were confirmed on Onslow Beach, North Carolina (Barick, 1981). Therefore, it is reasonable to expect that some nesting may occur along South Carolina beaches. However, few green turtles are likely to use in Winyah Bay or adjacent beaches. Therefore, the NMFS believes that the proposed action is not likely to jeopardize the continued existence of green sea turtles.

Loggerhead sea turtle. The loggerhead is the most abundant sea turtle along the Atlantic coast and is widely distributed. The entire Atlantic coast from Florida to North Carolina is an important breeding area for the loggerhead turtle. In the United States the major nesting beaches for this species are located on the east coast of Florida between Cape Canaveral and

Palm Beach, although nesting is known to occur in the Winyah Bay - Santee Delta area of South Carolina. Approximately 100 nests per season are located on Sand Island; 150-nests per season on South Island; and 150 nests per season on Cedar Island. The nearest nesting area is located approximately 8 miles southeast of the project area. Considerable use of Winyah Bay by all life stages of loggerheads, including hatchlings, is likely.

C. Shortnose Sturgeon: Shortnose sturgeon populations range from the St. John River, New Brunswick, Canada, to the St. John's River, Florida. They occur in rivers, estuaries and the sea within a few miles of land, but reach their greatest abundance in estuaries fed by major rivers. These fish are anadromous, moving up the river systems during spring to spawn. Shortnose sturgeon are not known to move between river systems. Therefore, each river may contain separate stocks. Three geographical regions can be noted. A northern distribution area is found between the St. John River in New Brunswick, Canada to the Merrimack River in Massachusetts, a central area includes the Connecticut River, Hudson River, and Delaware River, and a southern area can be described between Cape Hatteras and the St. John's River, Florida (Douglas Beach, pers. comm.). The status of shortnose sturgeon in Winyah Bay is poorly understood. No quantitative population estimates are available for the Winyah Bay population.

Shortnose sturgeon growth varies greatly depending on latitude, with the fastest growth occurring among southern populations. According to Brundage (1982) and Dadswell (ms), shortnose sturgeon grow more slowly, mature later, spawn less frequently, have larger eggs, and live longer in northern



latitudes than in the southern part of their range. The oldest (a 67-year-old female) and largest (a 122-cm, 23.6-kg female) shortnose sturgeon were taken from the St. John River in New Brunswick, Canada. Females mature at age 6 in Georgia and age 12 in New Brunswick, Canada. First spawning after maturity may be delayed up to five years in females. The average age of first spawning females in the St. John River is 15 years. While first spawning in the Hudson and Delaware Rivers may occur at about one-half the age reported for the St. John River, or about 7-10 years. In the St. John River, females spawn no more often than once every three years, and resting periods may be as long as 5-11 years. Spawning periodicity in more southern populations is unknown.

Dadswell (ms) determined that spawning occurs at or above the limit of tidal intrusion between February and May, depending on latitude. Spawning is initiated at temperatures of 9-12°C during or soon after peak river flows in the spring in river sections of fast flow (40-60 cm/sec to 100-300 cm/sec) with gravel or rubble bottoms, generally well upriver of summer foraging and nursery grounds (rkm 100-200).

Brundage (1982) and Dadswell (ms) found that fecundity of shortnose sturgeon ranges from about 12,000 to 14,000 eggs/kg body weight for fish from Canada to Georgia. Ripe eggs have a diameter of about 3 mm. Eggs are probably released close to the bottom, where they are fertilized. After fertilization, the eggs rapidly sink to the bottom and become very adhesive, strongly adhering to rough-surfaced substrates within about one minute. Hatching occurs in 12-16 days at 8-12°C.

Washburn & Gillis (1981) reported that shortnose sturgeon larvae hatch at lengths of about 7-10 mm, but those less than 8 mm long may not survive.

Larvae tend to remain on the bottom for the first 7-10 days. After 7-10 days, larvae begin to move off the substrate occasionally, but remain on or near the bottom most of the time. The yolk sac disappears after about 10 days (when larvae are about 14 mm long), and feeding activity begins. Older larvae become more active as they begin feeding. Limited success in collecting larvae with standard field sampling methods suggests that larvae may occupy interstitial spaces in gravel during their first few weeks of life.

Shortnose sturgeon appear to be strictly benthic feeders. Adults eat molluscs, insects, crustaceans, and small fish; juveniles eat crustaceans and insects. Feeding in freshwater is largely confined to periods when water temperatures exceed 10°C; feeding is heavy immediately after spawning in spring and during the summer and fall, but light in winter (Dadswell (ms)).

The Winyah Bay system may be the most important refuge for shortnose sturgeon in its southern distributional area. Few shortnose sturgeon have been reported south of Winyah Bay, although 18-19 fish were reported from the Altamaha River drainage, Georgia (Reidt and Gilbert, 1981). In North Carolina, Schwartz and Link (1976) describe shortnose sturgeon as extirpated, although definitive studies need to be conducted in the Tar, Neuse, and Cape Fear Rivers in North Carolina. Winyah Bay appears to be especially favorable to shortnose sturgeon because of the availability of deep water, good food supplies, and the relatively unaltered nature of the estuary and associated rivers.

In any consideration of shortnose sturgeon, each population must be considered independently. There are gaps between the northern, central, and southern populations of shortnose sturgeon. Moreover, shortnose sturgeon in

the various river systems may be independent since no apparent migration between river systems has been observed. Therefore, Winyah Bay represents a significant portion of the known shortnose sturgeon range.

#### Assessment Of Impacts

Oil, whether crude or refined, is best considered as a source of toxic compounds (Rice et al., 1976). Toxicity of oil depends on its state of refinement and on its concentration of various toxic components. The more refined distillates are generally the most toxic and volatile while physical smothering is most severe with crude oils and Bunker "C" fuel oil. Organisms exposed to oil may be affected in the following ways (Taft, 1981):

1. Direct lethal toxicity;
2. Sub-lethal disruption of physiological/behavioral activities, especially feeding and reproduction;
3. Direct coating of weathered oil on intertidal sessile species;
4. Incorporation of hydrocarbons into body tissues; and
5. Alteration of habitat, especially substrate characteristics and benthic communities.

Oil introduced into Winyah Bay by the refinery discharge and oil spills will likely be incorporated into bottom sediments and accumulate along the shorelines and in the marshes. Bio-deposition and attachment of oil to sediment particles would cause oil to sink. Sediment load to Winyah Bay

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totals approximately 1,063,073 cubic yards annually (Brownell, 1981). To date, there is no data available on the impacts of the existing Hess Oil storage facility on the Winyah Bay ecosystem.

The Winyah Bay project can be expected to have the following impacts on endangered and threatened species:

A. Sea turtles. Construction and operation of the refinery or related pipeline may affect loggerhead sea turtles. Except for the loggerhead, sea turtles are seldom encountered close to shore in the project area and therefore are not likely to be directly affected by the proposed activity. Our main concern is the potential impact of oil from the plant discharge and oil spills on turtles using Winyah Bay.

There is not a great deal of information available to assess the impacts of oil spills on sea turtles; therefore the effects of oil on turtles is poorly understood. However, there are certain potential impacts that can be discussed.

Sea turtles may ingest toxins from discharges or spills through the food chain. The 1979 CETAP report indicates that the loggerhead normally feeds on crabs and smaller bottom dwelling organisms in inshore areas. The Corps' "worst case" oil spill analysis projects substantial sinking of oil from contact with sediment in fresh water plumes and organic detritus, which indicates a potential for contamination of the loggerhead turtles food sources. Sea turtles may be indirectly affected by an oil spill due to changes in abundance or distribution of their preferred food species.

Direct impacts to sea turtles may also occur if they surface in an oil slick. Mortality has been observed among young turtles exposed to oil

(Witham, pers. comm.). Also stranded turtles have been found with tar balls in their mouths (Bruce J. Muga and Associates and Wilbur Smith and Associates, 1981). While it cannot be proven that the tar killed the turtles, it is possible that disruption of respiratory and/or feeding processes were contributing factors in their deaths. Compounds in oil such as 3-4 benzopyrene or other polycyclic aromatic hydrocarbons are carcinogenic or mutagenic (Scarratt, 1981). Thus, oil could produce cancers, tumors or other disorders in turtles, possibly affecting the long-term survival of individuals. It is likely therefore, that an encounter with oil would result in the death of some individual turtles. Young turtles are especially vulnerable.

1. Conclusion. The best available information indicates that the loggerhead is the only endangered or threatened species of sea turtles likely to be encountered in proximity to the project area or to be affected by the proposed activity. Considerable use of Winyah Bay by all life stages of loggerheads is likely. Exposure to oil could result in ingestion of tar balls or produce tumors, cancers and other disorders in these turtles. Although oil from plant discharge or oil spills may cause the death of some number of loggerhead sea turtles in Winyah Bay, the loss of a few individuals is not likely to affect adversely the entire population. Accordingly, the NMFS believes that the proposed action is not likely to jeopardize the continued existence of the loggerhead sea turtle.

B. Shortnose sturgeon. The NMFS believes that the construction phase of the project will not significantly affect shortnose sturgeon since the

probability of injuring the fish or disrupting its' habitat would be minimal. The proposed refinery will be constructed inland of the bay area with the related 600 foot pipeline being constructed under the Sappit River. It is our opinion that since construction will be confined to a limited portion of the project area, shortnose sturgeon will be able to avoid such activities. In addition, any construction related disruptions would be temporary in nature. However, the potential effects to shortnose sturgeon from the chronic discharge of oil and from oil spills are of concern to the NMFS. The refinery is expected to discharge 10-15 mg/l of oil and grease per day or about 730 gallons per year. There is a possibility that oil spills may occur. The Carolina Refining and Distributing Company (CRDC) has not yet provided an oil spill contingency plan for review. Therefore, we are unable to assess if the clean-up measures would be adequate to protect the shortnose sturgeon. The Corps' environmental assessment states that the plan would be completed after permits are issued for the refinery. However, even with a formalized clean-up plan, it has been stated by Bruce J. Muga and Associates and Wilbur Smith and Associates (1981) that, "In truth, a large spill in the lower portion of Winyah Bay could not be entirely controlled by today's spill control equipment and, therefore, coastal environments would be impacted." This is especially true because of the swift water movements in Winyah Bay.

The Corps' "worst case" oil spill analysis (Figure 1) indicates that within one hour oil will spread over 650 acres of water surface. Data further indicates that within 3 1/2 hours following a spill, oil can spread as far as Frazer Point and the marshes of Wassenaar Neck to the north and about one mile south of Channel Marker 15 near the Winyah Bay entrance. This would include

Mud Bay which is believed to be an important overwintering area for shortnose sturgeon.

Shortnose sturgeon in Winyah Bay may be killed as a direct result of an oil spill. McCain and Malins (1981) observed mortalities in demersal fish exposed to hydrocarbon contaminated sediments. Since shortnose sturgeon are bottom dwellers and their food supply consists of benthic organisms, contact with spilled oil is certain.

In the event of a severe spill, mortality of fish and benthic organisms is probable (Thomas, 1973; Anderson et al., 1974; Linden et al., 1979; Sanders et al., 1980). In addition, their food source, consisting of molluscs and other benthic organisms may be eliminated, reduced, or contaminated for considerable time periods. Adverse effects of oil on sediments and benthos were reported from the barge Florida spill off West Falmouth, Massachusetts, five years after the accident (Sanders et al., 1980). Thomas (1973) reported mortalities of Mya arenaria due to oil pollution from a tanker spill. The initial exposure resulted in the occurrence of another kill in the second year of pollution. Thus, a serious spill has the potential for immediate and long-term adverse impact on the shortnose sturgeon population in Winyah Bay, especially since the bay is relatively pristine. The entire bay system is susceptible to effects of oil and thus, shortnose sturgeon feeding areas may be damaged should a serious spill occur. Mud Bay, which is considered to be an overwintering area for shortnose sturgeon, would be affected by oil within 1 1/2 to 2 hours in the Corps' "worst case" oil spill analysis.

The effects of chronic (low levels of oil released over a period of time) discharges of oil and minor oil spills on shortnose sturgeon in Winyah Bay are

more difficult to assess; little information on effects of oil pollution on shortnose sturgeon is available. However, it has been determined that components of oil are carcinogenic and mutagenic (Scarvatt, 1981). Shortnose sturgeon may be particularly susceptible to these sublethal abnormalities since they may live 10 years or longer and thus may be exposed to and accumulate hydrocarbons over a long period of time. NMFS is also concerned with the potential effects of such oil pollution on the reproductive capability of shortnose sturgeon. This potential problem surfaced in the study of the Tsasis oil spill where a reduction in the spawning success of herring was reported (Linden et al., 1979).

Chronic oil pollution may also seriously contaminate shortnose sturgeon habitat and food sources. Farrington and Quinn (1973), in a study of Narragansett Bay, Rhode Island, documented the contamination of sediments and clams by hydrocarbons. Sewage effluent and small oil spills were the most probable sources of the petroleum hydrocarbons. This study is significant to the CEDC proposal since Narragansett Bay is larger than Winyah Bay and it was demonstrated that chronic levels of pollution from sewage effluent and small oil spills could spread throughout the bay. Armstrong et al. (1979), studied chronic oil pollution in Trinity Bay, Texas. Hydrocarbons were found in increased concentrations around an oil separator platform. Reduced numbers of benthic organisms were observed within 150 meters of the discharge and also were affected as far as 400 meters away. Armstrong further determined that polluted sediments could be resuspended and deposited outside of the effluent discharge area. This provides an additional mechanism for distribution of oil.

Synergistic effects of oil are also possible. Tagatz (1961) observed that the lethality of petroleum products to shad was found to increase when accompanied by low dissolved oxygen. Therefore, the potential for synergistic effects of oil and other pollutants is possible and may reduce the quality of shortnose sturgeon habitat and survival.

1. Conclusion. Based on the best scientific and commercial data available NMFS concludes that cumulative effects of the CRDC refinery relating to oil contamination of shortnose sturgeon, their habitat, and their food sources may adversely impact the population in the Winyah Bay system. The available information suggests that Winyah Bay is an important refuge for the species in the south. Few shortnose sturgeon have been reported south of Cape Hatteras. The Winyah Bay stock is not believed capable of sustaining direct losses or short and long-term damage to their environment and remain viable.

In view of the above, we believe the operation of the proposed CRDC refinery is likely to jeopardize the continued existence of the population of shortnose sturgeon within Winyah Bay.

#### Reasonable and Prudent Alternatives

The only reasonable and prudent alternative to the proposed action that we can suggest is to relocate the refinery to an area less sensitive to the maintenance of shortnose sturgeon. The NMFS cannot suggest specific locations because of the multitude of planning functions necessary to select an alternate site. However, the NMFS is prepared to assist the COE in developing alternate sites by examining impacts to endangered species from proposed projects at those sites.

#### Recommendations

This opinion is based on the limited information available on endangered and threatened species within our purview. The NMFS recommends the following studies that would allow for a more specific biological opinion:

1. In-depth research on the status of shortnose sturgeon stocks in Winyah Bay and associated rivers;
2. Behavioral and physiological studies for shortnose sturgeon stressed by oil as compared to unstressed shortnose sturgeon. Similar studies would also be appropriate for the green and loggerhead sea turtle;
3. Research on distribution, population size, and characteristics of sea turtles using Winyah Bay and associated beaches;
4. The long-term effects of oil in Winyah Bay should be addressed. We are particularly interested in effects of oil on the feeding ecology of endangered species and their food sources.

Consultation must be reinitiated if the studies or other new information reveals impacts of the identified activity that may affect any listed species or their habitat, the identified activities are modified in a manner not considered herein, or if a new species is listed or new critical habitat is designated that may be affected by the proposed activities.

Our biological opinion does not authorize any taking of listed species pursuant to Section 10(a) or immunize any actions from the prohibitions of

Sections 9(a) and 4(d) of the ESA. "Take" is defined in Section 3 of the ESA as: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Such "takings" are subject to prosecution unless covered by a ESA Section 10(a) permit or ESA regulations (for threatened species).

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- U.S. Outer Continental Shelf. Annual Report for 1979 to the Bureau of Land Management under Contract No. AA551-GT8-48. April 1981. 839 pp.
- Washburn & Gillis Associates, Ltd. 1981. Studies of the early life history of the shortnose sturgeon (*Acipenser brevirostrum*). Final report to Northeast Utilities Service Company. 120 p.
- Witham, R. Personal Communication. Florida Department of Natural Resources, P.O. Box 941, Jensen Beach, FL 33457

## ATTACHMENT 1

## CHRONOLOGY OF EVENTS

- o Public Notice 79-5R-319, dated December 3, 1979, advertised the proposal by Carolina Refining and Distributing Company to construct pipelines across the Sampit River to service a 30,000 barrel/day oil refinery near Georgetown, Georgetown County, South Carolina.
- o In response to P/N 79-5R-319, the Environmental Assessment Branch, NMFS, by letter of July 25, 1980, asked that an environmental impact statement be prepared. It was asked that endangered species be discussed in the EIS.
- o In further response to P/N 79-5R-319, by letter of April 21, 1981, we sent the Corps a list of endangered species which may be present in the project area. We further asked for preparation of a biological assessment and provided guidance for its preparation.
- o The Corps by letter of May 1, 1981, provided a biological assessment indicating that endangered species would not likely be jeopardized.
- o We responded to the Corps' May 1 letter on May 12, 1981. We agreed that whales would not likely be impacted, but stated that the biological assessment contained insufficient information to assess whether sea turtles or shortnose sturgeon would be affected.
- o By letter of December 18, 1981, the Corps again sent a biological assessment and asked for our opinion.
- o On January 13, 1982, we responded to the Corps' December 18, 1981 letter and attached biological assessment. We stated that while actual pipeline construction was not likely to jeopardize endangered species under our purview, possible oil spills and discharges from the refinery may have an impact. We again asked that more information be provided.
- o On February 17, 1982, the Corps responded to our January 13, 1982 letter. We were advised that the Corps felt they had provided as much information as could reasonably be expected and requested our biological opinion within 60 days.

B-32

## ATTACHMENT 2

## CORRESPONDENCE DEALING WITH CONSULTATION

July 25, 1980	Letter from William H. Stevenson to Colonel William Brown on P/N 79-5R-319 by Carolina Refining and Distribution Company (CRDC) to build an oil refinery near Georgetown, So. Carolina.
January 30, 1981	Letter from Harold B. Allen replying to Mr. John M. Rogers' transmittal of information on the CRDC proposal.
February 20, 1981	Letter from Eugene C. Brickleyer, Jr., to Harold Allen asking NMFS to initiate Section 7 consultation on CRDC proposal.
April 21, 1981	Letter from D.R. Ekberg to Colonel Bernard E. Stalman transmitting list of endangered species in area of CRDC proposal and initiating Section 7 consultation.
April 23, 1981	Letter from Harold B. Allen to Eugene C. Brickleyer, Jr., advising that NMFS had initiated Section 7 consultation on the CRDC proposal.
May 1, 1981	Letter from Colonel Bernard E. Stalman to D.R. Ekberg transmitting biological assessment on the CRDC proposal.
May 12, 1981	Letter from D.R. Ekberg to Colonel Bernard E. Stalman advising that the biological assessment on the CRDC proposal is inadequate and identifying additional information needs.
September 28, 1981	Memorandum from Bill Lindall to files advising of the phone conversation with E.C. Brickleyer on the CRDC proposal.
December 18, 1981	Letter from Colonel Bernard E. Stalman to D.R. Ekberg transmitting biological assessment on the CRDC proposal a second time along with other information.
January 13, 1982	Letter to Bernard E. Stalman from D.R. Ekberg advising that the biological assessment is inadequate and identifying information needs.



January 26, 1982

Letter from Eugene C. Brickleyer, Jr., to D.R. Ekberg asking for copies of recent NMFS comments to the Corps of Engineers.

January 29, 1982

Letter from D.R. Ekberg to Eugene C. Brickleyer, Jr., transmitting requested letter.

February 19, 1982

Letter from Colonel Bernard E. Stalman to D.R. Ekberg advising us to provide a biological opinion based on information Corps of Engineers previously provided.

February 19, 1982

Letter from Augustine T. Smythe to D.R. Ekberg providing information on the CRDC proposal.

March 1, 1982

Letter from John R. Clark to D.R. Ekberg providing information on the CRDC proposal.

March 5, 1982

Letter from D.R. Ekberg to Augustine T. Smythe acknowledging receipt of information.

March 16, 1982

Letter from D.R. Ekberg to John R. Clark acknowledging receipt of information.

March 18, 1982

Letter from Mary Lowndes Bryan to D.R. Ekberg providing information on the CRDC proposal.

March 22, 1982

Letter from D.R. Ekberg to Mary Lowndes Bryan acknowledging receipt of information.

#### DOCUMENTS REVIEWED FOR CONSULTATION IN ADDITION TO REFERENCES CITED

Buckley, J. and B. Eynard. 1981. Spawning and rearing of shortnose sturgeon from Connecticut River. *Prog. Fish-Cult.* 43(2) pp. 74-76.

Chemical Contaminants and Biological Abnormalities in Central and Southern Puget Sound. Executive Summary. NOAA Technical Memorandum OHP-2. Boulder, Colorado, November 1980.

Dedavell, M.J. 1979. Biology and population characteristics of the shortnose sturgeon, *Acipenser brevirostrum* LeSueur 1818 (Osteichthyes: Acipenseridae), in the St. John River Estuary, New Brunswick, Canada. *Can. J. Zool.* 57:2186-2210.

Davis and Floyd Engineers, Inc. 1981. Carolina Refining and Distributing Company, Proposed Refinery, Georgetown, So. Carolina.

Evans, D.R. and S.D. Rice. 1973. Effects of oil on marine ecosystems: a review for administration and policy makers. *Fish. Bull.* 72(3). pp. 625-638.

Fried, S.M. and J.D. McCleave. 1973. Occurrence of shortnose sturgeon (*Acipenser brevirostrum*), an endangered species, in Montserrat Bay, Maine. *J. Fish. Res. Board Can.* 30:563-566.

Hampson, G.R. and E.T. Moul. 1978. No. 2 fuel oil spill in Bourne, Massachusetts: immediate assessment of the effects on marine invertebrates and a 3-year study of growth and recovery of a saltmarsh. *J. Fish. Res. Board Can.* 35:731-744.

Korn, S., J.W. Struhsaker, and P. Benville, Jr. 1976. Effects of benzene on growth, fat content, and caloric content of striped bass, *Morone saxatilis*. *Fish. Bull.* 74(3). pp. 694-698.

Outer Continental Shelf Oil and Gas Development and the Coastal Zone. 1974. Prepared at the Request of Hon. Warren G. Magnuson, Chairman, Committee on Commerce, pursuant to S. Res. 222 National Ocean Policy Study. U.S.G.P.O.

Pottle, R. and M.J. Dedavell. 1980. Studies on larval and juvenile shortnose (*Acipenser brevirostrum*). Report to the Northeast Utilities Service Company in compliance with Purchase Order #091023.

Sanders, H.L. 1978. Florida oil spill impact on the Buzzards Bay benthic fauna: West Palmouth. *J. Fish. Res. Board Can.* 35:717-730.

Shortnose Sturgeon Recovery Team. 1981. Shortnose Sturgeon Recovery Plan, V. Synopsis of Biological Data on shortnose sturgeon. Review Draft to NMFS.

Smith, T.I.J. and D.E. Marchette. 1981. Listing of captures and identification of shortnose sturgeon, *Acipenser brevirostris*, by Atlantic sturgeon program personnel. South Carolina Wildlife and Marine Resources Department, Marine Research Institute, Charleston, South Carolina.

Taubert, B.D. and M.J. Dedavell. 1980. Description of some larval shortnose sturgeon (*Acipenser brevirostrum*) from the Holyoke Pool, Connecticut River, Massachusetts, U.S.A. and the Saint John River, New Brunswick, Canada. *Can. J. Zool.* 58:1125-1128.

U.S. Army Corps of Engineers. 1979. Public Notice 79-5R-319 advertising Carolina Refining and Distributing Company's proposed oil refinery.

U.S. Army Corps of Engineers. 1981. Biological Assessment for Compliance with the Endangered Species Act of 1973.

U.S. Army Corps of Engineers. 1981. Revised Environmental Assessment for Carolina Refining and Distributing Company (P/N 79-5R-319).



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

Commanding Officer  
Marine Safety Office  
196 Tradd Street  
P. O. Box 724  
Charleston, SC 29402

16450

11 June 1984

From: Commanding Officer, USCG Marine Safety Office, Charleston, SC  
To: District Engineer, Army Corps of Engineers, Charleston District  
P. O. Box 919, Charleston, SC 29402

Subj: ENVIRONMENTAL IMPACT STATEMENT FOR CAROLINA REFINING AND DISTRI-  
BUTION COMPANY PERMIT APPLICATION

Ref: (a) My letter of 3 January 1984

1. After reviewing the Environmental Impact Statement for oil refinery, Georgetown, South Carolina, draft dated April 1984, this command is satisfied with the entry of our comments from reference (a), and have no additional comments to make at this time.

*M. J. Schiro*  
M. J. SCHIRO

AC



# United States Department of the Interior

GEOLOGICAL SURVEY

Water Resources Division  
1835 Assembly Street, Suite 658  
Columbia, SC 29201-2492  
May 4, 1984

District Engineer  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, SC 29402

RE: Draft, Environmental Impact Statement for Oil Refinery, Georgetown,  
South Carolina, by U.S. Army Corps of Engineers, Charleston District,  
April 1984

Dear Sir:

My former employer (U.S. Geological Survey) and the major cooperator (South Carolina Water Resources Commission) for several reconnaissance studies in the region have asked if I would make a comment pertaining to statements attributed to me in the subject draft report. In doing so, it must be made clear that I am neither for nor against the proposed location of an oil refinery.

A 4-] There is a very critical contradiction between case 8, Johnson (personal communication, 1984), page VII.B-55, and Impacts to Water Quality, Johnson (personal communication, 1984), page VII.B-95. The latter statement in question (page VII.B-95) expresses a position I feel is correct. The former statement (page VII.B-55) results in a critical error arising probably from a mistaken understanding of the context of the statement.

"... at high slack tide the saltwater is pushed to its maximum upstream position and spreads out into the bordering salt marsh. On the ebb tide, the channel proper is flushed by the downstream flow of river water, but a portion of the salty water is stranded in the marsh. During the next flood tide, this salty water is carried farther upstream, diluted, and again stranded in the marshes. By this process, the salty water can be carried upstream to a point limited only by the upstream limit of flood tidal currents."

The context of the statement referred only to Sappit River during low-flow conditions when there would be very little freshwater inflow into the river. In an estuarine system with almost no freshwater inflow as compared to the channel volume--the saltwater intrusion will indeed penetrate to the upper reaches of tidal currents. Again, if there is moderate freshwater inflow as

The discussion of case 8 which is now on page VII.B-57 has been corrected.

District Engineer  
May 4, 1984  
Page 2


in the Ashepoo River the saltwater will in large measure, due to the overflow of marshlands, move upstream over several tidal cycles to a greater extent than the centroid of the tidal node until an equilibrium is reached between the incoming tidal forces (including the marshland overflow) and the forces generated by the freshwater inflow. However, as was seen in the Cooper River low-flow study in 1978 the upstream movement of the saltwater front is relatively sluggish taking several days to move a few miles upstream. Likewise, the movement upstream of an oil spill would be sluggish. When freshwater inflow is increased, the front will retreat. The chances of even trace amounts of an oil spill as presented in case 8 reaching Bucksport or beyond seem to be nil. If not impossible, the chances of such an occurrence are extremely remote.

The point of equilibrium, to which reference was made above, exists farther upstream for those rivers with low freshwater inflow and farther downstream for those with high freshwater inflow. As noted on page VII.B-95, the relation between freshwater inflow and the saltwater interface showed the point of equilibrium if freshwater inflow was 3,000 ft<sup>3</sup>/s to be about river mile 16 on both the Pee Dee and the Waccamaw Rivers. While the marshland effect of saltwater intrusion contributes to the intrusion, it does not contribute to it past the point of equilibrium. Therefore, because the amount of freshwater inflow to the Intracoastal Waterway from the Pee Dee and Waccamaw Rivers is considerable, the movement of an oil slick in large amounts as in case 8 would probably move no farther upstream than the tidal excursion. Because of the marshland effect a considerably lesser amount could move a few miles upstream in small increments of distance each tidal cycle; however, this upstream movement would be limited and probably not come close to reaching even Bull Creek.

Again, because of the Pee Dee and Waccamaw inflow, it is entirely feasible to withdraw freshwater for domestic or industrial supply at a location above the point of equilibrium of the interface at high slack water. Such withdrawals, however, should not lower the freshwater inflow to the system to the extent that the point of equilibrium overtakes the location point of withdrawal.

In sum, in my opinion, the conclusions drawn in case 8, page VII.8-55 are in error and the statement regarding water supply on page VII.B-95 is correct.

If there are any questions, please call me at 803/356-4146 or write me at P.O. Box 7, Lexington, SC 29072.

Sincerely, 

F. A. Johnson  
Hydrologist, Retired

FJAJ/slm

cc: Alfred H. Vang, S.C. Water Resources Commission

State of South Carolina  
Water Resources Commission



May 25, 1984

Alfred H. Vang  
Executive Director

LTC F.L. Smith  
District Engineer  
U.S. Army Corps of Engineers  
Charleston District  
ATTN: SACEN-E  
P.O. Box 919  
Charleston, South Carolina 29402

RE: Draft Environmental Impact Statement for Oil Refinery,  
Georgetown, South Carolina

Dear Colonel Smith:

The S.C. Water Resources Commission staff has reviewed the above referenced DEIS and submits the following comments for your consideration in preparation of the Final EIS.

Section VI.F. Socioeconomics. - We suggest that unemployment statistics be added to this section since high unemployment in Georgetown County is an often cited element in the overall need for the refinery project.

Section VI.H. Climate. - More detailed, site specific information is available on storm surges and should be included in this section. This information is available from Mr. John Purvis, State Climatologist, at 758-2514.

Section VI.J. Geology and Topography. - Section VII.D.3 indicates that the refinery would use process water obtained from deep wells located on site. This differs from previous information provided to us which reported that water would be purchased from the City of Georgetown. If process water is to be obtained from wells in amounts exceeding 100,000 gallons per day, we suggest that Section VI.J should indicate that the site is located within a Groundwater Capacity Use Area, and that a Groundwater Use Permit would be required from the S.C. Water Resources Commission.

Section VI.K. Research Institutions. - We suggest the addition of information on economic benefits of the Tom Yawkey Wildlife Center similar to that provided for Hobcaw Barony.

Section VII.B.2.a. Chronic (Continuous) Discharge - The composition and volume of wastewater discharge discussed in this section is not the same as that described in the Revised Environmental Assessment. Projected discharge volume has increased from 500,000 gallons per day to almost 1.1 million gallons per day. What is the reason for this change?

Employment statistics for Georgetown County have been added to page VI.F-17.

Site-specific data on storm surges has been added to page VII.H-1.

The current plan is for the refinery to obtain process water from deep wells located on site. Page VI.J-4 has been revised to show that the site is located within a Groundwater Capacity Use Area and that a Groundwater Use Permit would be required from the S.C. Water Resources Commission.

The economic benefits of the Tom Yawkey Wildlife Center have been added to VI.K-2.

Wastewater has been characterized by different consultants on the basis of different levels of treatment. The applicant proposed a higher level of treatment and EPA adjusted some values to provide a better characterization of wastewater. See pages VII.B-13 and VII.B-17 for explanation of how wastewater parameters were developed.

AI-6

All wastewater discharge impacts in this section and in later sections on fish and wildlife impacts are based on effluent composition from a "typical" refinery and on information provided by the applicant's consultant. This effluent composition information is in some areas different from Federal Effluent Limitations and Water Quality Criteria used to develop wastewater discharge permit requirements. Consequently, the effluent described in the DEIS is not one which would be allowed under existing regulatory programs. We believe this discrepancy between the projected effluent and the allowable effluent casts doubt upon the discussion of chemical and biological impacts of the wastewater discharge. Unless the refinery project could not or would not comply with applicable effluent limitations, we suggest the Final EIS contain an assessment of impacts based on these limitations.

B-38

The actual characteristics of the proposed refinery wastewater cannot be adequately determined until the plant and its treatment systems are designed. The water quality assessment made for this EIS was based upon interim design specifications and estimated effluent characteristics supplied by the applicant rather than any effluent limitations the applicant may be required to comply with. The rationale for this decision is discussed below.

It is germane to this discussion to point out that the NSPS effluent limitations given in the EIS are predicated upon current design specifications for the proposed CRDC refinery and are not necessarily the final NSPS requirements that the refinery, if permitted, would be subject to. The reasons for this are inherent in the procedures used to define applicable subcategories and process factors within subcategories in 40 CFR Part 419 (Petroleum Refining Point Source Category Effluent Limitations Guidelines, Pretreatment Standards and New Source Performance Standards; Final Rule). NSPS effluent limitations are promulgated for five subcategories defined by the basic design of the refinery. In addition, within each subcategory, the relative throughput capacity of each process used is multiplied by a weighting factor assigned to that process and the sum of the products is used to obtain a process factor (see Table VII.B-8). This, together with a size factor dependent upon feedstock per stream day, is applied to effluent limitations for the applicable subcategory to obtain the final NSPS effluent limitations for a specific refinery.

This determination of effluent limitations, therefore, is dependent upon each refinery's size and process design. Since the process design of CRDC's proposed refinery is not final, the calculated NSPS effluent guidelines given in Table VII.B-9 and VII.B-10 only can be viewed as approximations. Thus to minimize the chance of adding additional error, all impact assessment procedures are applied to the original design estimates supplied by the applicant. The calculated effluent limitations given here serve to show areas of concern if the present design factors are incorporated into a final design scheme. Caveats relating to the use of calculated effluent limitations based upon design approximations have been added where appropriate in the EIS text.

AI-7

This section also discusses use of the RECEIV II model to assess water quality impacts. It is our understanding that this model is applicable only to conservative (non-degrading) wastewater components, however, the model was used to project concentrations of oil and grease which are degraded in the environment.

The RECEIV model section in the impact to water quality discussion has been revised. The intent is to provide a reasonable discussion of the dispersion and potential fate of the various pollutants. Specific concentrations for the various components as they are dispersed in the Sumpit River are not included. The result is a subjective assessment that also considers the degradation expected for many of the constituents. Tables VII.B-11 and VII.B-12 have been changed to show the information necessary for this assessment.

AI-8 Section VII.B.2.b. Oil Spills. - We believe some indication of the probability of occurrence of each described oil spill scenario would be helpful. If possible, please consider including this information in the Final EIS.

AI-9 For Case #9, we feel it unlikely that spilled oil would be transported as far upstream in the Pee Dee and Waccamaw Rivers as indicated in the DEIS. This concern is described in detail in a May 4, 1984 letter from Mr. F.A. Johnson (formerly of the U.S. Geological Survey) to the District Engineer, U.S. Army Corps of Engineers, Charleston District (copy attached).

AI-10 Since one of the major impacts of spilled oil would probably be on the sediment and associated bottom-dwelling biota, we believe additional information should be included in the Final EIS to describe amounts of oil which could collect in sediments, persistence in sediments, rate of leaching from sediment, and effect on sediment movement.

AI-11 Section VII.C.2.6. Impacts of Chronic Discharges. - As indicated above, we feel the assessment of wastewater impacts should be based on current Effluent Limitations and Water Quality Criteria rather than on a hypothetical effluent which may not meet regulatory requirements.

See the response to comment AF-10 regarding the probability of occurrence of each of the spills addressed in the seventeen oil spill scenarios.

The discussion of case 8 which is now on page VII.B-57 has been corrected.

In the absence of adequate field data on sediment distribution and sediment transport as well as laboratory evaluations concerning the interactions between Venezuelan crude oil, refined products and sediments, reasonable, quantitative estimates cannot be made. This is discussed in Section VII.B.2.b(4)(b) - Data Limitations.

See the response to comment AI-6.

LTC F.L. Smith  
May 25, 1984  
Page 3

We appreciate the opportunity to review the DEIS and submit the above comments. Please feel free to contact us if you have questions regarding our comments.

Sincerely,  
  
Alfred H. Vande  
Executive Director

ARV:tb

Attachment

cc: Gene Seifried  
Robert Bierbaum  
Susan Graber  
Lucas Dargan  
Robert Ferrell  
Homer Gamble





# United States Department of the Interior

## GEOLOGICAL SURVEY

Water Resources Division  
1835 Assembly Street, Suite 658  
Columbia, SC 29201-2492  
May 4, 1984

District Engineer  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, SC 29402

RE: Draft, Environmental Impact Statement for Oil Refinery, Georgetown,  
South Carolina, by U.S. Army Corps of Engineers, Charleston District,  
April 1984

Dear Sir:

My former employer (U.S. Geological Survey) and the major cooperator (South Carolina Water Resources Commission) for several reconnaissance studies in the region have asked if I would make a comment pertaining to statements attributed to me in the subject draft report. In doing so, it must be made clear that I am neither for nor against the proposed location of an oil refinery.

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"... at high slack tide the saltwater is pushed to its maximum upstream position and spreads out into the bordering salt marsh. On the ebb tide, the channel proper is flushed by the downstream flow of river water, but a portion of the salty water is stranded in the marsh. During the next flood tide, this salty water is carried farther upstream, diluted, and again stranded in the marshes. By this process, the salty water can be carried upstream to a point limited only by the upstream limit of flood tidal currents."

The context of the statement referred only to Sampit River during low-flow conditions when there would be very little freshwater inflow into the river. In an estuarine system with almost no freshwater inflow as compared to the channel volume--the saltwater intrusion will indeed penetrate to the upper reaches of tidal currents. Again, if there is moderate freshwater inflow as

District Engineer  
May 4, 1984  
Page 2

in the Ashepoo River the saltwater will in large measure, due to the overflow of marshlands, move upstream over several tidal cycles to a greater extent than the centroid of the tidal node until an equilibrium is reached between the incoming tidal forces (including the marshland overflow) and the forces generated by the freshwater inflow. However, as was seen in the Cooper River low-flow study in 1978 the upstream movement of the saltwater front is relatively sluggish taking several days to move a few miles upstream. Likewise, the movement upstream of an oil spill would be sluggish. When freshwater inflow is increased, the front will retreat. The chances of even trace amounts of an oil spill as presented in case 8 reaching Bucksport or beyond seem to be nil. If not impossible, the chances of such an occurrence are extremely remote.

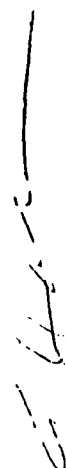
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Again, because of the Pee Dee and Waccamaw inflow, it is entirely feasible to withdraw freshwater for domestic or industrial supply at a location above the point of equilibrium of the interface at high slack water. Such withdrawals, however, should not lower the freshwater inflow to the system to the extent that the point of equilibrium overtakes the location point of withdrawal.

In sum, in my opinion, the conclusions drawn in case 8, page VII.8-55 are in error and the statement regarding water supply on page VII.3-95 is correct.

If there are any questions, please call me at 803/356-4146 or write me at P.O. Box 7, Lexington, SC 29072.

Sincerely,



F. A. Johnson  
Hydrologist, Retired

FJAJ/sim  
cc: Alfred H. Vang, S.C. Water Resources Commission



*South Carolina  
Wildlife & Marine  
Resources Department*

James A. Timmerman, Jr., Ph.D.  
Executive Director

May 29, 1984

Colonel F. Lee Smith, Jr.  
Charleston District, Corps of Engineers  
P. O. Box 919  
Charleston, South Carolina 29402

Re: Draft Environmental Impact Statement for the  
Permit Application by Carolina Refining and  
Distributing Company

Dear Sir:

Personnel of the South Carolina Wildlife and Marine Resources Department have reviewed the Draft EIS for the above referenced project. We would like to congratulate you for the use of cooperating agencies with special expertise in the preparation of this document. It does indeed present a broader perspective on this issue.

The various sections prepared by the cooperating agencies are generally well done and adequate for describing the project site and potential impacts on the environment.

The section on water quality by the Environmental Protection Agency and the section on fish and wildlife resources prepared by the U. S. Fish and Wildlife Service address the primary issues of concern to our Department. These sections are thorough and detailed in their analysis of the resources and the potential impacts on the outstanding natural resources values of Winyah Bay.

As you are aware, the South Carolina Wildlife and Marine Resources Commission has previously conducted a thorough review of this project and concluded that the project would result in significant adverse environmental impacts. The Commission has also recommended that all State and Federal permits for this project should be denied. We are gratified that the facts presented in the Draft EIS support our previous conclusions and recommendations.

However, we are amazed that the Corps of Engineers in two pages (V. 7 and V. 8) of this voluminous document totally discount and disregard the findings of the cooperating agencies which even the Corps acknowledges have special expertise in the areas covered in their sections of the report. There is no justification for the assumption that in spite of all the facts presented the operation of the refinery will result in an increase in pollutants that "does not appear significant." The impacts of chronic spills is not even addressed even though the document states

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

Rembert C. Dennis Building ☐ P.O. Box 167 ☐ Columbia, South Carolina 29202 ☐ Telephone: 803-758-0020

Colone) F. Lee Smith, Jr.  
May 29, 1984  
Page 2

that chronic spills are potentially more harmful than a catastrophic spill.

VI-2

Table V.1, comparison of alternatives ignores the unique fish and wildlife values of the Winyah Bay system and relegates the refinery impacts on fish, wildlife and endangered species to "minor." Considering the wealth of resources at the proposed site, the impacts of the project can hardly be considered to be identical at alternative sites in Charleston and other unspecifed sites. It should also be pointed out that while there is no currently designated "critical habitat" in Winyah Bay, there are several endangered species recovery plans being considered for approval which would officially designate critical habitat areas in the Winyah Bay region.

VI-3

It should be noted that the portion of South Carolina's coast from Capers Island to North Island has been nominated to be a Biosphere Reserve as part of the U. S. Man and the Biosphere program. As a member of a worldwide network of Biosphere Reserves, the area would be used for baseline monitoring, ecological research, preservation of genetic resources, and training and education. Biosphere Reserves generally are areas which harbor a wide variety of undisturbed representative ecosystems and processes and are protected to some extent. Man and the Biosphere is an international program administered in the U. S. by the State Department. The final EIS should address potential impacts to the area's significance as a Biosphere Reserve.

B-44

VI-4

The section on socio-economics should be expanded to include more information on the employment and economic benefits provided by wildlife and waterfowl management activities. For example, the total annualized cost for waterfowl management in the Winyah Bay area is approximately 1.3 million dollars. Annual management costs are well in excess of \$600,000 and does not include any expenditures for necessary supplies and equipment. We are also enclosing more detailed information on the waterfowl resources of Winyah Bay and the potential impacts on this resource for inclusion in the final EIS.

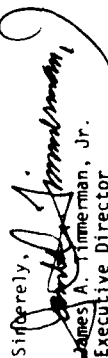
VI-5

The section on the significance of the research institutions - Hobcaw Barony and the Tom Vankey Wildlife Center - hardly does justice to the value of the research and management activities being conducted in Winyah Bay, and their economic impact on the community. There also needs to be further evaluation on the impacts of oil pollution on the long term research and management efforts.

VI-6

The summary of resources on page VII, C-56 and the summary of impacts on these resources on pages VII C-57 and VII C-58 tell the whole story of the siting of an oil refinery in Winyah Bay. The resource values are extraordinary and the adverse impacts of the project are undeniable. We continue to urge you to deny this permit application, and request that our Department's position be included in the EIS as the official position of the State agency with statutory responsibility for fish, wildlife, endangered species and marine resources management.

Sincerely,

  
James A. Zimmerman, Jr.  
Executive Director

JATjr:cs

attachment

See the response to comment A1-1. Table V.1 is a summary table which compares certain broad aspects of various alternatives. For purposes of this comparison, it was assumed that all water quality standards would be complied with and since the propagation and survival of aquatic life is protected use of Class SC and higher classes of waters, it was further assumed that there would be no unacceptable impacts to fish and wildlife resources at any site. To the extent of this evaluation, the effects of a refinery at Charleston or other unspecifed sites should be similar. This comparison did not include a detailed evaluation of any site in Charleston because there was no available SO<sub>2</sub> increment in the Charleston area and no prospect for obtaining the required air quality permit. The information on recovery plans has been added to page VII-36.

According to this comment, only the coast from Capers Island to North Island has been nominated to be a Biosphere Reserve. Since the areas most likely to be affected by the refinery are the Sampit River, Winyah Bay proper, and the lower reaches of tributary streams, we do not believe the EIS should be revised to address this nomination and how the coast's possible future designation as a Biosphere Reserve would be affected by a refinery on the Sampit River.

The economic information provided in this comment has been added to page VII-D-2. However, the additional information on waterfowl resources is not added to the EIS because the coverage already devoted to fish and wildlife resources in pages VI-D-1 to 44 and VII-C-1 to 77 is sufficient for evaluating the potential effects of the refinery on these resources.

Water quality and fish and wildlife resources are addressed in greater detail in the draft EIS than any other subject. The research and management activities conducted at Hobcaw Barony and the Tom Vankey Wildlife Center appear to be addressed in sufficient detail, and since specific additional information has not been provided, further revisions to those portions of the EIS do not appear warranted.

Comments noted.

### Significance of the Winyah Bay Area to Wintering Waterfowl

The Winyah Bay area is the most important waterfowl wintering area on the South Carolina coast. During January 1984, over 80,000 ducks, or approximately 64 percent of the ducks in the state were wintering in the Winyah Bay area (Williamson 1984). The primary habitats utilized are estuarine impoundments.

These impoundments are managed as waterfowl feeding and resting areas primarily through water level manipulation directed towards the growth of submersed aquatic vegetation, primarily *Spartina alterniflora*, for quality waterfowl foods. The provided waterfowl food is composed of a mixture of plant and animal material. Wastewater treatment ponds, which are managed to provide a high quality waterfowl food, are also an important part of the waterfowl wintering area. The waterfowl wintering area is located in the estuary of the state's largest river, the Santee River, which empties into the Atlantic Ocean. The waterfowl wintering area is located in the estuary of the Santee River, which empties into the Atlantic Ocean. The waterfowl wintering area is located in the estuary of the Santee River, which empties into the Atlantic Ocean.

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### Waterfowl Wintering Area

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Canvasbacks. The clumped distribution of canvasbacks in South Carolina (over 61 percent in Georgetown County) is probably caused by a concentration of optimal canvasback habitat which produces desired plant and animal foods at relatively

few locations. The most important animal food of the canvasback in South Carolina, the Baltic clam (*Macoma balthica*), is distributed in the middle portions of Winyah Bay (Cely 1979).

The impacts of acute oil spillage in the middle region of the bay would probably have the most disastrous effects of any area in the Winyah Bay system. Because of the special characteristics of the middle bay, even a relatively small spill or the persistence of low concentrations of petroleum hydrocarbons would have serious adverse effects (Allen et al. 1984). Oil spills in the middle bay area would result in irrevocable damage to one of the most important canvasback wintering areas in the State. Additionally, the long term effects of chronic discharge of oil and grease and unavoidable handling losses at the proposed refinery site could adversely affect the Baltic clam and hence threaten canvasback habitat.

Wood Duck: The most important duck nesting in South Carolina, the wood duck, is also the most important duck in terms of harvest to both Georgetown County and South Carolina waterfowl hunters (S. C. Wildlife and Marine Resources Department, unpublished report). The intertidal abandoned ricefields and impoundments of the Pee Dee-Waccamaw rivers delta constitute valuable wood duck breeding, brood rearing, and wintering habitat with as many as 5,000 wood ducks utilizing this area during the fall and winter (R. D. Perry, S. C. Wildlife and Marine Resources Department, personal communication).

The most dramatic detrimental effects of chronic and acute oil pollution in the upper portions of the Winyah Bay estuary, including the lower Waccamaw and Pee Dee River marshes, would be the destruction of intertidal marsh plants which receive direct oiling. Plant communities along the shore zone and adjacent to the ricefield ditches would be expected to experience the most drastic declines. Perturbation of the marshes would not only result in the overall reduction of primary production, but it would eliminate irreplaceable habitats for major estuarine invertebrates, fishes and birds (Allen et al. 1984). These impacts undoubtedly would alter the lower Waccamaw-Pee Dee delta marshes such that their importance as high quality wood duck habitats would be threatened.

Greater Snow Goose: Increases in the greater snow goose population have recently led to an expansion of its wintering range and within the past three years a flock of about 400 birds has been observed near Georgetown, South Carolina (Canadian Wildlife Service et al. 1981). During the period of 1981-84 this flock has increased in size numbering up to an average of 3,000 birds which utilize the beach front sand bars and marsh impoundments on Murphy Island where they feed on the rootstocks of saltmarsh bulrush (T. H. Strange, S. C. Wildlife and Marine Resources Department, personal communication).

The bulk of greater snow goose flocks typically occupy small geographical areas on the wintering grounds which makes the geese potentially vulnerable to pollution (Canadian Wildlife Service et al. 1981). Therefore, an offshore oil spill in the vicinity of the Winyah Bay entrance (hypothetical oil spill case 15) would jeopardize the Murphy Island greater snow goose flock.

**Mottled Duck:** The Winyah Bay area marsh impoundments are the primary breeding, brood rearing, and wintering habitat for the mottled duck in South Carolina (Strange and Wilkinson 1983). Mottled ducks are essentially non-migratory and therefore would be subject to direct mortality associated with oil spills throughout the year and degradation of water quality from chronic oil pollution would adversely impact mottled duck management efforts in general.

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South Carolina Department of Archives and History  
1430 Senate Street  
Columbia, S.C.

P.O. Box 11,669  
Capitol Station 29211-1669  
803-758-5816

May 30, 1984

Lt. Colonel F. L. Smith, Jr.  
District Engineer  
Charleston District  
Army Corps of Engineers  
PO Box 919  
Charleston, SC 29402

Re: Draft Environmental Impact  
Statement, Carolina Refining  
and Distributing Company Oil  
Refinery, Georgetown County

Dear Lt. Col. Smith:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the proposed Georgetown County Oil Refinery and the installation of two underwater pipelines across the Sampit River. The Army Corps, under Section 106 of the National Historic Preservation Act of 1966, has the responsibility to identify all National Register and potentially eligible properties that may be directly or indirectly affected by a proposed undertaking.

It is our opinion that the Draft EIS does not adequately identify all National Register and potentially eligible properties in the undertaking's area of environmental impact, nor does it address potential adverse effects to these properties. Our concerns are as follows:

A1-1

1. The proposed oil refinery site on the Harmony Plantation tract has been the subject of a cultural resources overview. Although the report indicates that no significant cultural resources were identified within the interior of the tract, three archaeological sites tentatively identified as H-1, H-2 and H-3 were identified along the banks of the Sampit River, which forms the northern boundary of this tract. It is our opinion that these three sites (two prehistoric sites and one historic archaeological site) are eligible for inclusion in the National Register of Historic Places. The Draft EIS does not address the potential adverse effects of the oil refinery construction on these three sites.

A1-2

2. No cultural resources investigation of the three alternative pipeline routes was conducted. There is the possibility that significant but unknown archaeological sites may lie within the pipeline routes. These sites need to be identified, and potential impacts to significant sites must be addressed. The Draft EIS also fails to address potential impacts to the three sites referenced in #1 above (H-1, H-2, and H-3).

Section F, on page VII.6-1 has been clarified to show that neither the refinery nor the pipeline should affect the three sites identified as H-1, H-2, and H-3.

The discussion in the EIS is sufficient as it applies to alternatives; however, if a permit is to be issued which deviates from the proposal by incorporating an alternative which would potentially affect a listed or eligible site, the consultation requirements of Section 106 of the National Historic Preservation Act will be followed before issuance.

Since these alternative sites are outside the "permit area" as defined in Appendix C to 33 CFR 325, and no work is currently proposed at these sites, cultural resource surveys are not necessary at this time.

3. As far as we are aware, no cultural resources survey has been conducted to identify resources in the alternate site areas of Myrtle Grove (Georgetown) and on the Cooper River (Charleston). Those areas selected should be surveyed and any resources identified evaluated. Potential effects to significant sites should be identified. This has not occurred for either of these areas.

4. The Harmony Plantation site is located across the Sampit River from Friendfield Plantation, an 18th and 19th century rice plantation proposed for inclusion in the Thematic Rice Culture of Georgetown National Register nomination, and clearly eligible for inclusion in the Register. It appears that this property might be affected by pipeline construction. Potential affects to the property should be addressed in the EIS.

5. The City of Georgetown contains a large historic district that is included in the National Register of Historic Places. This major National Register property is not discussed in the Draft EIS, although significant impacts to the city, the district, and properties in the district can be expected as a result of proposed undertaking. Such impacts should be discussed in the EIS.

We believe the Draft EIS is inadequate; the Corps has failed to assess the effect of the proposed pipeline routes and refinery siting. A proper assessment should include intensive archaeological survey of all areas potentially affected by the undertaking. This recommendation is in agreement with the recommendations made by the Advisory Council on Historic Preservation in their letter to you of April 18.

The Federal procedures for the protection of historic properties (36 CFR 800) require that the Federal agency official in charge of a federally funded or licensed project consult with the appropriate State Historic Preservation Officer. The procedures do not relieve the Federal agency official of the final responsibility for reaching an opinion of his own as to whether or not historic values have been adequately taken into account in allowing the project to proceed. The opinion of the State Historic Preservation Officer is not definitive, either by law or by established Federal procedure. In reaching a conclusion of his own, the Federal agency official may well wish to consult other experts.

Friendfield Plantation will not be affected by pipeline construction. This property is located on the opposite side of the river from the proposed pipeline alignment. The pipeline will cross the Sampit River approximately one and one-half miles from the nearest boundary of Friendfield Plantation.

Section F. on page VII.G-1 has been revised to show that neither the refinery nor the pipeline should affect the City of Georgetown Historic District.

Lt. Col. F. L. Smith, Jr.  
May 30, 1984  
Page Three

If you have questions, please do not hesitate to contact  
Ms. F. Langdon Edmunds, Historic Preservation Protection and Planning  
Division Head or Ms. Nancy Brock, Environmental Review Specialist, at  
(803) 758-5816.

Sincerely,



Charles E. Lee  
State Historic Preservation Officer

CEL/vdw

CC: Mr. Danny Cromer  
State Clearinghouse

Ms. Trish Jerman  
Division of Natural Resources  
Office of the Governor

Mr. David Reid  
Division of Natural Resources  
Office of the Governor

Mr. Robert Garvey  
Advisory Council on Historic Preservation

Dr. Wayne Beam  
SC Coastal Council



# State of South Carolina

Office of the Governor

RICHARD W. RILEY  
GOVERNOR

POST OFFICE BOX 11450  
COLUMBIA 29211

May 23, 1984

Lieutenant Colonel F. Lee Smith  
Department of the Army  
Charleston District,  
Corps of Engineers  
Post Office Box 919  
Charleston, South Carolina 29402

Dear Colonel Smith:

The Corps of Engineers is to be commended for requiring an Environmental Impact Statement (EIS) for the proposed oil refinery in Georgetown, South Carolina. My staff has reviewed the Draft EIS and attended the public hearing held in April. Their comments are attached.

I share their concerns. In particular, I am puzzled by the apparent inconsistency of (a) your acceptance without question of the economic impacts of the project (as outlined by the applicant) and (b) your reluctance to accept predictions of environmental damage, especially those made by the United States Fish and Wildlife Service. The two "sides" of the question merit equal treatment.

In its evaluation of permit applications, the Corps assumes that the applicant has completed appropriate economic evaluations, and that the applicant's proposal is economically viable and there is a need for it in the market place. The economic benefits of many projects are important to the local community and contribute to needed improvements in the local economic base, affecting such factors as employment, tax revenues, community cohesion, community services, and property values. Many projects also contribute to the National Economic Development by increasing the net value of the national output of goods and services. With specific regard to the proposed oil refinery, energy conservation and development are designated as major national objectives. 33 CFR 320.4(n). The economic information provided by the applicant has been included as submitted. It shall be evaluated impartially in the decision making process.

I am also troubled that this Draft EIS is not based on a final refinery design, so that the impacts can be more accurately determined and evaluated. It seems to me that an EIS should be completed only upon review of a completed refinery design.

The Draft EIS represents a good start but only with additions and modifications will the final product effectively present the impacts of the proposed project.

Yours sincerely,

*Dick Riley*  
Richard W. Riley

RWR:bd

cc: Brigadier General Forrest T. Gay

The Corps requires permit applicants to submit sufficient information to enable the Corps to make an informed decision. The preparation of a final design of a facility such as this refinery would be very expensive, and it is not essential for the Corps to make its public interest determination. In this particular case, the market for refinery products changed during the time this permit application was under review, so the preliminary refinery design was revised to provide for a different array of products.

F-52

AL-3

V-2

GOVERNOR'S OFFICE COMMENTS  
DRAFT EIS - GEORGETOWN REFINERY

MAY 22, 1984

1. The Corps notes that the United States Environmental Protection Agency (EPA) and the United States Fish and Wildlife Service were asked to prepare portions of the EIS falling "within their areas of special expertise." The Corps notes in its summary that one of the advantages to this approach is the "broader perspective" brought to bear on the problem. However, they go on to note, that "the divergent perspective and environmental evaluation of these participating agencies 'preclude full agreement on the magnitude of all impacts.'" The Corps then significantly discounts the impacts projected by the cooperating agencies.

The first reason cited for this "discounting" is the "findings of various state agencies as evidenced by permits and certifications." Some of this information is misleading however.

-- The Corps notes that a Prevention of Significant Deterioration permit for air emissions was issued by DHEC in July of 1979. This permit, which is technically a construction permit, has already been extended once and has since expired. The applicant will have to reapply, and conditions may be different at the time of reapplication than they were in 1979.

-- The Corps notes that a 401 Water Quality Certificate was issued by DHEC in May of 1980 "which certifies that the refinery should not contravene any state water quality standards." The reference is not correct. The 401 certification actually certifies that construction of the proposed pipeline should not contravene any state water quality standards. It does not address the refinery itself.

-- It should be noted that the Budget and Control Board has not yet issued a permit to the refinery and will not until after all DHEC permits are obtained. In addition, the Water Resources Commission has established a subcommittee to determine whether sufficient new information has been presented to warrant a reconsideration of the agency's recommendation.

-- DHEC officials have said that the applicant must reapply for an NPDES (water quality) permit. Since DHEC prepared a draft permit for the project (to which the applicant did not respond) new federal regulations have gone into effect which are more stringent and more expensive to meet than those in effect at the time of initial application.

2. The Corps has evaluated the extensive information and conclusions presented by the Fish and Wildlife Service and the EPA and has chosen to draw its own conclusions in certain cases. In contrast, conclusions regarding economic benefits appear to be based solely on the statements of the applicant and are not questioned at all. (It is interesting to note that the section devoted to socioeconomic impacts consists of 2 and 1/2 pages of text and a chart, as opposed to some 220 pages devoted to other types of impacts.)

The favorable economic impact expected from the refinery is based on an assumption of 90 direct employees, with an average direct wage of about \$28,000. The paragraph also assumes a secondary employment of 40, apparently with the same wage scale, resulting in an annual payroll of

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

See the responses to comments AL-1 and AL-3.

\$2.9 million. There are several significant questions about the validity of this assumption. First it seems highly unlikely that the refinery will employ even 90 people (as opposed to the 150 the applicant claims will be employed.) A small refinery (18,000 barrels a day) in Alaska currently employs 22 people, and plans to expand its production to 35,000 barrels a day. The manager stated that the increased production "might" cause him to hire an additional two employees. A refinery in Louisiana which at one time was touted as a "model" for the proposed refinery only employed about 60 employees.

In addition, the Draft EIS states "most" of the refinery's employees would be "technicians and laborers." It is difficult to believe that the salaries of a workforce comprised primarily of laborers and technicians will average \$28,000/annum. Therefore, it seems that the economic benefit to Georgetown could be significantly overrated.

Perhaps even more important than the possible over-estimation of economic benefits is the failure to consider economic losses associated with the refinery. Since there is currently no shortage of petroleum products in the Georgetown area, it is probable that existing distributors will lose jobs and/or revenue when the refinery begins operation. It is also possible that economic losses will accrue to water dependent industries such as fishing and seafood processing. These losses should be explored and balanced against anticipated economic gains, and the analysis should appear in Section D along with anticipated benefits.

The Corps states that the public need for the project "lies primarily in the ready supply of refined products in the region." As noted above, there is no evidence of a shortage of refined products in the region at the present time. On a larger scale, a number of publications have indicated that refinery capacity must be reduced, rather than expanded. The Oil Daily (March 2, 1984) describes the need for refineries to process the heavier "sour" crude, and states that "a major increment of hydrocracking capacity is coming on line from major projects at the Citgo Refinery . . . Amoco . . . Texaco" refineries. It also notes that Exxon already has "a great deal of heavy crude capability."

If the proposed refinery is in fact going to be in the public interest, it must compete with these major firms already able to process sour crude. The EIS should provide a more extensive analysis of how this will be done.

The original report prepared by the Fish and Wildlife Service ends with a recommendation for permit denial. Since the entire report, with the exception of this recommendation seems to have been reproduced in the EIS there should be some explanation for the omission.

The Corps takes an impartial position on permit actions until the public interest review has been completed following the public review period of the final EIS. Although cooperating agencies actually wrote parts of the EIS, the EIS is nevertheless a Corps EIS and our impartial position makes it inappropriate to have a recommendation for permit denial in the EIS.

AL-6

5. The Draft EIS states that the final design of the Georgetown facility had not been completed at the time the draft EIS was finalized. As a result, impacts were not fully analyzed in many cases. The EIS should not be finalized until the design of the refinery has been completed.

See the response to comment AL-2.

AL-7

6. A number of health related concerns were raised at the public hearing, including the fact that Georgetown already has a somewhat higher rate of certain types of cancer than the rest of the state. The effect of "increased (cancer) mortality in geographic areas where refineries are located (VII. A-27) on Georgetown's cancer incidence should be examined.

The DEIS notes on page VII.A-24 that numerous epidemiological studies have indicated that refinery workers are not subject to increased health risks over the general population. In spite of a world-wide research effort of many years, the cause of cancer is poorly understood. The Corps does not believe there is sufficient evidence linking refineries to cancer to warrant further consideration in the EIS.

B-55

AL-8

7. The occurrence of the recent oil spill in Georgetown Harbor should be noted in the final EIS and its implication discussed.

Upon the advice of the Governor's office, we contacted DHEC to obtain information on this particular spill. DHEC estimated the spill to consist of approximately two gallons of what was later identified as Number 2 diesel fuel near a marina in Georgetown. DHEC believes a boat was the source of the spill. This incident happened independently of any refinery and the Corps does not believe it has any special relevance to this EIS for an oil refinery.

# South Carolina Department of Health and Environmental Control

2400 Bull Street  
Columbia, S.C. 29201

Commissioner  
Robert S. Jackson, M.D.



Board  
Moses H. Clarkson, Jr., Chairman  
Leonard W. Douglas, M.D., Vice-Chairman  
Barbara P. Nussle, Secretary  
Gerald A. Kaynard  
Oren L. Brady, Jr.  
James A. Spruill, Jr.  
William H. Heiser, M.D.

June 14, 1984

District Engineer  
Attention: Mr. John L. Carothers  
Charleston District  
Corps of Engineers  
P.O. Box 919  
Charleston, S.C. 29204

Dear Mr. Carothers:

We have reviewed the "Draft Environmental Impact Statement for Oil Refinery, Georgetown, South Carolina" prepared under the leadership of your office and offer comments herein.

The air quality information appears to be accurate. As stated in the Draft EIS, Carolina Refining and Distributing Company's Prevention of Significant Deterioration (PSD) permit has expired and an application must be resubmitted.

See the response to comment AC-2 regarding the deletion of material on page V.7.

A-1]

On page V.7, a statement is made that DHEC issued a Section 401 Water Quality Certificate which certifies that the refinery should not contravene any State water quality standards. This is incorrect in that the certification applies only to the pipeline under the Sampit River and not the operation of the Refinery. This Department also administers Section 402 of the Federal Clean Water Act and therefore has separate permitting authority for waste discharges to adjacent waters. Since this separate permitting authority exists within this Department, review for 401 certification purposes was limited to the pipeline crossing.

A National Pollutant Discharge Elimination System (NPDES) permit under Section 402 has not been issued and none is pending issuance. Carolina Refining and Distribution must submit a new application for consideration under present State and Federal regulations. Mr. N. R. Dorrance has been advised of actions necessary to pursue the NPDES permit (see attached letter).

In the Summary, the discussion of adverse impacts on water quality is too subjective in some cases and needs more objectivity. Statements that significant increases in ambient levels of pollutants would occur without reference to the expected concentrations and the expected impacts on aquatic fauna and without consideration of EPA Water Quality Criteria do not shed much light on the expected effect of ambient levels after operational discharges begin. The narrative should provide more specific discussion of these matters.

The lack of a quantitative model for specifically assessing the impacts of degradable pollutants in the proposed refinery wastewater prompted a number of changes in the text with regard to ultimate component concentrations in the water column. This type of information cannot be effectively included in the summary. However, changes were incorporated in the summary on pages VII.B-113 and VII.B-114 of the section on "Cumulative Water Quality Impacts," that better summarize the expected impacts on water quality of the proposed refinery.



Mr. John L. Carothers  
June 14, 1984  
Page Two

AP-3

The statement that "oil spills will occur with predictive regularity" is not quantified anywhere. Hypothetical spill scenarios are discussed, but quantification of the predictive regularity could not be found in the document.

See the response to comment AP-10 regarding the probability of occurrence of each of the spills addressed in the seventeen oil spill scenarios.

AP-4

On Page II.5., subjective statements that long term impacts from chronic exposure to hydrocarbon and heavy metal pollutants would occur should be followed up with examples from scientific literature. Surely, there are publications documenting impacts around existing oil refineries. Discussion of such documented impacts would add more scientific objectivity to the EIS. Such information is important, especially in the Summary.

Such detailed information is beyond the normal scope of a summary. Examples from the scientific literature of sublethal impacts to biota from chronic exposure to hydrocarbon and heavy metal pollutants occur throughout Section VII.C. of the document.

AP-5

The S.C. Coastal Council does not have specific authority to approve or deny permits in coastal waters (Page VI. C-5), but rather has the authority to certify whether such permits contravene the S.C. Coastal Management Plan. DMFC cooperates with the Coastal Council by providing them with discharge permit information necessary for their certification review.

The description of the Coastal Council's purview has been corrected on page VI.C-5.

B-57

If you have any questions about these comments, please call me at 758-5496.

Sincerely,

*Chester E. Sansbury*

Chester E. Sansbury  
Manager, Impact Analysis & Standards Section  
Water Quality Assessment & Enforcement Division  
Bureau of Water Pollution Control

CES:bg

Attachment

cc: Mr. James A. Joy  
Mr. O. E. Pearson  
Mr. Robert G. Gross

# South Carolina Department of Health and Environmental Control



**Board**  
Moses H. Clarkson, Jr., Chairman  
Leonard W. Douglas, M.D., Vice-Chairman  
Barbara P. Nuzsik, Secretary  
Gerald A. Kaynard  
Oren L. Brady, Jr.  
James A. Spruill, Jr.  
William H. Hester, M.D.

April 26, 1984

Requested Mail

N.R. Dorrance, President  
Carolina Refining & Distributing Co.  
P.O. Box 10  
Old Greenwich, CT 06870

Re: NPDES No. SC0037311 Draft Permit  
Carolina Refining & Distributing Co.  
Georgetown County

Dear Mr. Dorrance:

The subject draft permit was mailed to you for examination and consideration on September 16, 1981 with the requirement that comments should be received by us no later than October 16, 1981. Our files do not indicate that you have responded in any way.

Subsequent to the creation of the draft, the EPA Guidelines for Petroleum Refining dischargers have been issued in final form (40 CFR Part 419, Federal Register, October 18, 1982) with the result that the promulgated bases for determining effluent limitations must now be used in the preparation of a permit. The calculation of limitation is quite complex and involves a detailed knowledge of each type of process to be used in the refinery, throughput for each process, and the determination of process and size factors (as defined and explained in the final regulations) to be used in calculating limits.

As a result of these considerations, the draft permit furnished to you must now be considered withdrawn and void. Also, since the application was submitted more than four years ago, it must be either resubmitted or amended to show the latest information in detail sufficient for use with the Guideline regulations concerning effluent limitations. If you would like to arrange a meeting to discuss this, please call me on (803) 758-5483. In any event we would like to be informed of your intentions.

Very truly yours,

*Douglas A. Solley*

Douglas A. Solley, P.E.  
Industrial & Agricultural Wastewater Division  
Bureau of Water Pollution Control

DAS/jf  
Cc: District Office  
EPA, Region IV



SOUTH CAROLINA  
DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION  
PO BOX 191  
COLUMBIA, S.C. 29202

May 23, 1984


District Engineer  
U.S. Army Engineer District, Charleston  
ATTN: SACEN-E  
Post Office Box 919  
Charleston, South Carolina 29402

Gentlemen:

In reference to your letter dated April 4, 1984 concerning the Draft Environmental Impact Statement for Oil Refinery (EIS-8404-004), the South Carolina Department of Highways and Public Transportation has reviewed this matter and does not foresee any interference with any presently proposed construction.

If we can be of any further service, please call us.

Yours very truly,

  
Herman P. Snyder  
State Highway Engineer

cc: Danny L. Cromer, State Clearinghouse  
Precons. Engrg. Mgmt. Coord. McIlwain

AN



UNIVERSITY OF SOUTH CAROLINA  
GEORGETOWN, S. C. 29440

BELLE W. BARUCH

Marine Field Laboratory  
P. O. Box 1630  
(803) 546-3623

May 18, 1984

Col. Lee Smith  
U.S. Army Corps of Engineers  
P.O. Box 919  
Charleston, SC 29402

Dear Col. Smith,

We have carefully examined the Draft Environmental Impact Statement for the proposed refinery in Georgetown and, although we are impressed with the thorough analysis conducted by the US Fish and Wildlife Service, and US Environmental Protection Agency, we are very disappointed with the Charleston District Army Corps of Engineer's interpretation of the facts. In this letter we will suggest some general aspects of potential environmental impact that were not examined in the Draft EIS, reconsider some of the most important criteria pertaining to a decision on the compatibility of the project with the environment, and criticize your present position on the issue.

The Baruch Institute has contributed a great deal of information to the Draft EIS through our studies in North Inlet and Winyah Bay, and our broad based understanding of the structure and function of coastal ecosystems. Based on our review of the existing scientific data on the condition of the Sampit River, we believe that this system is significantly stressed by existing industrial and municipal discharges. Many statistics on the magnitude of the pollution problem are presented in the Draft EIS, and studies conducted by Environment Analysis of Florida have demonstrated that the benthic community in the Sampit River is not characteristic of healthy southeastern estuaries. This river has a slow flushing rate and salinity and sediment characteristics which enhance the retention of pollutants. We disagree with your logic that since aquatic life persists in the Sampit River, additional pollution can be tolerated. Although fish, crustaceans, and zooplankton have been collected in the Sampit River by the SC Wildlife and Marine Resources Dept. and the Baruch Institute, there is no indication that populations and communities are flourishing in this area. No ecologist familiar with the present condition of the Sampit River would agree with your assessment of the situation.

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.7 to reflect impacts identified in the DEIS but not addressed in the table.

AC-1

Col. Lee Smith  
May 18, 1984

Page 2

Another aspect of your statement on the Projected Effects of Refinery Operation (item 2 on V.7.) with which we disagree has to do with the significance of the projected 9.32 increase in the levels of oil and grease discharged into the Sompit River. Your interpretation of this and other statistics provided by EPA are totally unjustified and, from a scientific standpoint, indefensible. Available evidence indicates that the Sompit River is polluted to the extent that organisms are already living near or at their limits of tolerance. The proper interpretation of the effect of more pollution, even an estimated 9% of oil and grease, is that the condition of the ecosystem will degenerate further. Continued destruction is likely to result in irreversible damage to the Sompit River and an extension of the impacted zone further into Winyah Bay. The Draft EIS clearly documents the regional and national significance of this estuary.

We would also like to point out an important aspect of the proposed refinery's operation which is not directly addressed in the Draft EIS. EPA has calculated that the industry will contribute more than 2000 tons of hydrocarbons to the air each year. This is more than four times the amount currently produced by existing industry and is about 200 times the amount predicted to be discharged directly into the water. There is little doubt that a large proportion of these airborne pollutants will ultimately return to Winyah Bay through direct settling on the waterways and marshes and through runoff from surrounding uplands. Airborne hydrocarbons pose more direct threats to marshes, forests, and wildlife outside of the Sompit River area than do hydrocarbons in the effluent. Note that this is a very large volume of pollutants whose fate is not discussed in the Draft EIS.

It remains inconceivable to us that the Corps has called upon the experts to study the probable environmental consequences of this project, received well researched and honest assessments of the situation, and, then, chose to disagree with the significance attributed to those impacts. There is no justification for the conclusions that you have reached.

An Environmental Impact Statement is a risk analysis in which potential benefits and environmental consequences are to be evaluated. With the exception of some vague and unsubstantiated statements about the anticipated economic benefits for Georgetown County, the Draft EIS contains a huge volume of facts which undeniably demonstrate the proposed project will threaten the quality of life in this area. Risks that the quality of the air, surface water, groundwater, wetlands, aquatic organisms, endangered species, commercial fisheries, tourism, recreation, and human health will degenerate are real and cannot be considered less important than the relatively small positive contribution that this industry will make to the local community. We urge you

The lack of a final refinery design and specific information on the types, amounts and emission rates of hydrocarbons has prevented discussion of the specific effects these hydrocarbons may have on Winyah Bay. As part of the PSD permit application, a detailed air quality study would be required, at which time, the effects of hydrocarbons would be addressed.

The DEIS states on page VII.A-14 that an air quality analysis based on specific process emissions and final design is required as part of the permit application and permitting procedures. Ambient air quality monitoring prior to submitting the new permit application may also be required. A permit cannot be obtained unless the analysis shows that all air quality standards will be met and no remaining allowable increments will be exceeded.

See the response to comment AD-1.


See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. See also the response to comment AE-8 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of water quality in Winyah Bay.

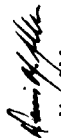
Col. Lee Smith  
May 18, 1984

Page 3

to reconsider the facts that appear in the Draft EIS and to restructure your comments in the "Comparison of Alternatives" section of that document. No imposed permit conditions could sufficiently reduce the impact of a refinery in the Sampit River. The only alternative is permit denial.

Sincerely,

  
F. John Vernberg, Ph.D.  
Director

  
Dennis M. Allen, Ph.D.  
Assistant Director

DMA/spe

cc: Brig. Gen. Forrest Gay  
Gov. Richard Riley  
US Fish and Wildlife Service, Mr. Steve Gilbert  
Environmental Protection Agency, Mr. Bowman Crum

B-62

EUGENE C. BRICKLEY, JR.

ATTORNEY AT LAW  
40 BROAD STREET

CHARLESTON, SOUTH CAROLINA 29402

MAIL ADDRESS: P. O. BOX 1204

TELEPHONE: 682-8700

May 28, 1984

LTC P. Lee Smith  
District Engineer  
U.S. Army Engineer District,  
Charleston  
ATTN: SACEN-E  
Post Office Box 919  
Charleston, S.C. 29402

Re: P/N 79-5R-319  
Carolina Refinery and  
Distributing Company

Dear Colonel Smith:

Please find enclosed our comments on the Draft Environmental Impact Statement (DEIS) for the above-captioned application. They are presented on behalf of George M. Cheston, Mrs. Sidney C. Devereaux and Mrs. Frances C. Train, co-owners of Friendfield Plantation, Georgetown, South Carolina, represented by Augustine T. Smythe of Buist, Moore, Smythe and McGee of Charleston. The comments are joined in by The Center for Lowcountry Environments, Charleston, and the Center for Environmental Education, Washington, D.C., whom I represent.

The 139 line-item comments critique the DEIS in the order the material is presented by the Corps. On occasion, they reference comments previously made by the parties mentioned above for the record of the public hearing on this matter held in October, 1981. Relevant sections of those have been attached to, and are to be considered a part of, our comments today.

Our review of the DEIS and our attendance at the Georgetown public hearing on April 26, 1984, have revealed certain general problems associated with the application, the document, and the Corps' oral and written summaries of the DEIS. These are listed below in summary form.

(1) We believe that it is unfortunate that the Corps hired experts to prepare sections of the DEIS on air, water and fish and wildlife impacts and then chose to either ignore, discount or misrepresent their findings. An example of this occurs at page V.7 and in Table V.1. As noted in our

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

Colonel Smith  
Page 2  
May 28, 1984

comments, we do not find the reasons offered by the Corps for acting in this manner persuasive. These summaries should be corrected or completely removed.

AR-2

- (2) It was also unfortunate that at the public hearing in Georgetown on April 26 you chose to show slides which stated that the plant would meet all air quality standards and that it presented no health effects. In fact, EPA found that the refinery may violate standards for sulphur dioxide emissions, hydrocarbon emissions and ozone, and may degrade visibility at Cape Romain National Wildlife Refuge. They also reported that there is growing evidence that workers in oil refineries and communities in which they are located show increased risks of cancer.

You also stated that the refinery "will not affect endangered species by its operations." The National Marine Fisheries Service prepared a biological opinion several years ago which says that it will jeopardize the continued existence of a population of one species and will impact a number of others. The Fish and Wildlife Service also found the project would be injurious to listed species under its control.

Finally, it is necessary to point out the error in the opening remark you made at the hearing, the statement to the effect that the public opposition "all hinges on the oil spill." An examination of the previous formal written comments by all the organizations, public and private, and most of the individuals opposed to the refinery will indicate that this is not the case. Certainly if there was any doubt as to the multitude of environmentally degrading aspects of a refinery at Winyah Bay, these are removed by the DEIS, which was available prior to the hearing.

B-64

AP-1

- (3) The overall impression, from the viewpoint of what is known about the specific construction and process plans for this refinery (the \$10 permit application for which was filed in 1979), is that the DEIS represents a generic study of a 30,000 bpd oil refinery to be located on an unacquired, unoptioned site, somewhere on Harmony Plantation. In many instances the DEIS designs the plant and then evaluates its impact, often without reference to what, if anything, the applicant has proposed in this particular regard. We see no assurances offered that what is analyzed here as a refinery will be what becomes a reality if CRDC obtains its permit.

AR-5

- (4) The Corps is bound by its regulations, by the National Environmental Policy Act and regulations issued thereunder and by decisions of the courts to establish that the proposed project is in the public interest. That determination is arrived at by weighing public benefits against public detriments. The former can be established by projecting, among other things, the economic advantages the project promises. But for this to be a practical evaluation, the project must in fact be needed and be likely to succeed.

Since this refinery has not yet been designed, the analysis in the DEIS was based in part on an existing design which indicated that there could be violations for non-methane hydrocarbon and ozone. It did not indicate a violation for sulfur dioxide. The DEIS states on page VII.A-14 that an air quality analysis based on specific process emissions and final design is required as part of the permit application and permitting procedure. Ambient air quality monitoring prior to submitting the new permit application may also be required. A permit can not be obtained unless the analysis shows that all air quality standards will be met.

See the response to comment AF-2 regarding the Corps' compliance with the Endangered Species Act. The FWS has not issued a jeopardy finding for any species under its jurisdiction.

A detailed design has not been prepared for the proposed facility. See the response to comment AL-2 regarding the Corps' requirement for information from permit applicants.

See the response to comment AL-1 regarding the national policy on energy needs and the Corps' position on the economic evaluation of permit applications.



Colonel Smith  
Page 3  
May 28, 1984

This requires that the facts be gathered and completely analyzed.

In the case of CRDC, the project is said to be necessary to fill the need for refined petroleum products within a 100 mile radius of Georgetown. Secondly, it is supposed to supply jobs and generate tax revenue. However, the DEIS nowhere substantiates these bold statements. We believe the project may not be needed at all. Recent articles cited in our comments state that refineries nationwide are running at less than 75% of capacity; and a Gulf Oil executive says refiners should cut capacity further. Without an exceptional case being made for the Georgetown area, this would not seem to be an auspicious time to be proposing a small oil refinery. There is no information presented to show that petroleum product demand is not now being met in this market, or that a new refinery could profitably displace refiners and suppliers who currently supply this area. Furthermore, even if there is an unfilled demand, it may be met by conservation or by investments in alternate energy forms, alternatives which should be, but are not discussed in the DEIS.

Having found that there was nothing but blind faith justifying any assumed benefits, we looked at the detrimental effects which the project would have. The EPA finds that it could violate air standards and might well decrease visibility at Cape Romain National Wildlife Refuge, the only Class I Air Quality Area in the state of South Carolina. It would cause degradation of water quality and would introduce, on a consistent basis, in addition to oil and grease, a myriad of other toxic substances which persist and bioaccumulate, some of which, such as PCB, are carcinogenic. These substances would flow into the Sampit River or Turkey Creek or Pennyroyal Creek (these latter two are mentioned in the DEIS even though the impacts on them were not studied because it is not known where the applicant proposes to discharge wastewater effluent from the plant) and eventually into Winyah Bay. During the life of the plant, there could also be accidental spills, certainly small ones and perhaps a catastrophic one, further degrading the environment. The National Marine Fisheries Service says the operation of the plant will negatively impact sea turtles and is likely to jeopardize the continued existence of the endangered shortnose sturgeon. The Fish and Wildlife Service says that both permitted discharge and accidental spills will greatly decrease the quality of the Bay and will cause problems for all creatures (including endangered species) who live in it or depend upon it.

On balance it appears that with the information that is provided in the DEIS, the public interest will not be served by permitting the project.

(5) The biological opinion issued by the National Marine Fisheries Service states that under the terms of the Endangered Species Act, the operation of the proposed CRDC

See the response to comment AR-3.

refinery is likely to jeopardize the continued existence of the southern population of shortnose sturgeon. This cannot be ignored, the current Corps' stance. Without use of the best scientific data available to show that the NMFS is incorrect in its assessment (something the Corps has not done to date either within or without the confines of the DEIS), the Corps can not issue a permit without being in violation of this federal law.

(6) The Fish and Wildlife statement that the environmentally preferred alternative is to deny the permit should be placed in the DEIS as submitted by that agency to the Corps.

(7) Alternatives are inadequately considered in that refineries which could be located in Florida, Georgia and North Carolina are not discussed, even though clearly within the capability of the applicant and within the scope of NEPA-required alternative considerations. Conservation as a method of meeting any unfilled demand is not considered and neither are alternate energy forms.

F 66

(8) There is no worst case scenario for hazardous waste spills, or for fires and explosions at the refinery site or the tank farm.

(9) There is still no application for a §404 Clean Water Act permit, even though the DEIS mentions that wetlands will be disturbed by various aspects of the project.

(10) There is no valid Clean Air Act permit application and no valid §402 Clean Water Act NPDES (wastewater effluent) permit application, thus leaving it uncertain as to exactly what will issue from the stacks or flow out of discharge pipes into the environment.

(11) There is no Resource Conservation and Recovery Act permit application, even though numerous hazardous wastes subject to regulation will be generated by the refinery.

(12) The Corps still has not complied with its duty to carry out consultations under the National Historic Preservation Act of 1966.

See the response to comment AL-5 regarding the Corps' impartial position on permit actions.

One of the two major purposes of the scoping meeting held by the Charleston District on 22 July 1983 was to determine what alternatives should be addressed in the EIS. The Corps presented what it believed to be a full range of reasonable and practicable alternatives for consideration in the EIS and no one in attendance suggested that additional alternatives should be addressed. Mr. Brickmeyer attended the scoping meeting but did not suggest a need for additional alternatives until this letter which was submitted after the public review period had expired. The contention that sites in Florida, Georgia, and North Carolina should be discussed is merely a variation of "other unspecified sites in South Carolina" and would contain similar, if not the same impacts. Alternatives of conservation or alternate energy forms are beyond the scope of this EIS.

Neither the Corps nor cooperating agencies believed that worst case analyses were warranted beyond those presented in the EIS for oil spills.

See the response to comment AF-9 regarding the nationwide permit for pipelines.

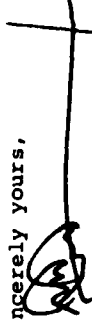
Although a final refinery design has not been developed, the nature and quantities of pollutants can be estimated with sufficient accuracy from the New Source Performance Standards that the refinery will be compelled to meet and from information based on other refineries provided by the applicant's consultants.

See the response to comment AD-1 regarding the lack of impact to cultural resources.

For the above reasons and those stated in our comments, we request that the \$10 permit be denied as not in the public interest.

We appreciate the opportunity to participate in the decision-making process as to this important project.

Sincerely yours,

  
Eugene C. Brickley, Jr.

ECBj:rf

COMMENTS

DRAFT ENVIRONMENTAL IMPACT STATEMENT  
FOR  
OIL REFINERY, GEORGETOWN, SOUTH CAROLINA  
PREPARED BY U.S. ARMY CORPS OF ENGINEERS, CHARLESTON DISTRICT,  
APRIL 1984; P/N #79-5R-319, DECEMBER 3, 1979,  
CAROLINA REFINING AND DISTRIBUTING COMPANY

SUBMITTED BY

FRIENDFIELD PLANTATION, GEORGETOWN, S.C.  
THE CENTER FOR LOWCOUNTRY ENVIRONMENTS, CHARLESTON, S.C.  
CENTER FOR ENVIRONMENTAL EDUCATION, WASHINGTON, D.C.

## INTRODUCTION

The Corps of Engineers has been requested to approve a permit application by Carolina Refining & Distributing Company for two submarine pipelines beneath the Sampit River in Georgetown County in order that an oil refinery might be constructed on the banks of that river and be supplied oil from and transport finished product to the Georgetown State Ports Authority, Pier 31. The Corps' authority to allow interference with a navigable body of water comes from Section 10 of the Rivers & Harbors Act of 1899, 33 U.S.C. §403 (1982). Before a permit to so interfere may be issued, the District Engineer must ascertain that the project meets certain standards and be found in the public interest. 33 C.F.R. §320.2 (1983); 33 C.F.R. §320.4(a) (1983); 33 C.F.R. §325.2 (1983).

The public interest impact assessment conducted by the Corps must include an evaluation of the factors of conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage protection, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production, and, in general, the needs and welfare of the people. It must also be evaluated as to its specific effect on wetlands, fish and wildlife, water quality, historic, scenic and recreational values, whether it is consistent with coastal zone management criteria, how it is viewed vis-a-vis the other federal, state, and local requirements, and whether it is in or affects a floodplain. 33 C.F.R. §320.4 (1983).

In considering the environmental impact, the Corps must consider the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §4321 et seq. (1982), which was passed to assure that the federal government used all means practicable "...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." 42 U.S.C. §4331 (1982). To this end an environmental impact document must be prepared on all major federal actions significantly affecting the quality of the human environment before such actions can commence. 42 U.S.C. §4332(2)(C) (1982). Regulations of the Council on Environmental Quality (CEQ) under NEPA require that in order to determine the possible impact and its significance, the NEPA process shall be initiated from the outset of a project. 40 C.F.R. §1501.2 (1983). Specific Corps' regulations implementing NEPA are drawn so that from initiation and throughout a project requiring decisions "...in the regulation of activities affecting waters of the United States, the goals and policies of NEPA will be considered to ensure decisions in the public interest." 33 C.F.R. §230.5 (1983).

The Draft Environmental Impact Statement (DEIS) on the proposed oil refinery was issued in April 1984. Our comments are a part of the public input of the NEPA process.

As fully set out in the DEIS's description of the area which would be affected by this project, Winyah Bay and its tributaries form an estuary of national significance providing resources of value to commercial, recreational, research and nonconsumptive, aesthetic users. It affords high quality, protected habitat to a myriad of species including those of special interest, as well as a number of threatened and endangered animals.

The siting of an oil refinery at the head of such an estuary must provide sufficient benefits when weighed against its negative environmental aspects to meet the Corps' requirements that the permit granting is in the public interest. The Corps states that "the public need for this product [sic] lies primarily in the ready supply of refined products in the region." DEIS p.IV.1 It states that it will also have a positive effect on the tax base of Georgetown County and create up to 100 jobs, 90% of which will be filled by local residents. DEIS p.IV.1. Upon reading the DEIS in its entirety, we find that nowhere in the document is the stated primary need for--i.e. public benefit from--the project ever referred to again with substantiating data, while in sections on air, water and fish and wildlife impacts, there appear massive amounts of data substantiating the long term, perhaps irreversible, negative impacts of the proposed refinery. We do not believe that the project has been shown to be in the public interest and therefore the permit must be denied.

#### SUBSTANTIVE COMMENTS

Comments will be consecutively numbered for ease of future reference and for convenience of reviewers be preceded by the page number in the DEIS to which they refer.

Page # and	Comment #	Comment Text
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12-13	I.1	(1) The statement that adverse air water and aquatic resource impacts can be "avoided" is not substantiated in the DEIS. The word should be removed. (See e.g. DEIS pp.II.2, II.4, II.5-6.)
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12-14	I.1	(2) Prevention and control plans, manuals and operations do not resolve the issue of what to do about absolute damage to natural resources. This should be stated.
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The referenced statement reads "....Can be avoided or their severity reduced by the use of better treatment methods now available." We believe the word "avoided" is acceptable when read in context with the complete statement.

We do not believe the additional information recommended in this comment is appropriate for inclusion in a 1-paragraph abstract.

SUMMARY

II.1

- (3) A general comment about the summaries throughout the document is that they too often either omit problems stated in the full text or incorrectly or inadequately characterize these problems. A number of instances will be illustrated in these comments. An effort should be made to remove such inconsistencies.

II.1

- (4) There is no supporting data anywhere in the DEIS for the second sentence here and its findings that a) "products can be competitively marketed within a 100-mile radius of Georgetown..." b) these products "would contribute to fulfillment of energy needs of this region..." (by implication currently unmet or poorly met) and c) that there is a "demand for refined petroleum products" (again presumably unmet or poorly met). It is not shown that there is an unmet need. Similarly if in the alternative, "b)", "c)" and thus "a)" are based upon the new refinery displacing current refiners and suppliers of products, that proposition is also not substantiated. Either the second and third sentences must be removed or data supplied to support it. Furthermore, the refinery will not "enlarge the economic base of Georgetown unless it can fulfill a need, and succeed. Again, this has not been shown; either the phrase must be substantiated or the entirety of subsection "4." removed.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. The market area was specified by the applicant. The basis for the market area being within 100 miles of Georgetown is the applicant's belief that he can competitively market refinery products within that area. The purpose and need for the proposed refinery is addressed in Section IV to the extent required by Corps of Engineer policy contained in 33 CFR 230 App. B §11(b)(4).

- AR-16 II.1 (5) The summary should state that the air quality analysis is based upon theoretical data since there is no final plant design and there is a lack of certain important meteorological and other information which prevents certainty from being attained.
- §5.1.
- AR-17 II.1 (6) In an example of the summary giving misleading information, the second sentence is incorrect and should be changed to read "there is also a possibility that the proposed refinery could consume more than [replace "all of"] the remaining 24-hour SO<sub>2</sub> increment in both the Georgetown Class II area and the Class I area of Cape Romain." Not mentioned at all here, but given substantial treatment in the text is the fact that even with the acceptance of questionable reductions in the amounts of hydrocarbon emissions, the refinery may well violate hydrocarbon and ozone standards. Finally, it may decrease visibility at the Cape Romain National Wildlife Refuge, the only Class I Air Quality Area in South Carolina.
- AR-18 II.2 (7) The second chart on this page should include a column showing allowable totals of pollutants.
- II.3 (8) The air impact conclusions should note something about the meteorological situations in South Carolina which make it (with Georgia) a region where air is more often stagnant than elsewhere on the East Coast. This would seem to decrease the ability of even tall stacks to remove polluted air from the generating area.
- AR-16 II.1 (5) The summary should state that the air quality analysis is based upon theoretical data since there is no final plant design and there is a lack of certain important meteorological and other information which prevents certainty from being attained.
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Summaries by definition are brief and can not include excessive detail without defeating their purpose. The recommended information is contained in the text, but is not believed essential to a summary.

See the response to comment AR-2 regarding the requirement of DHEC for an air quality analysis which must demonstrate that the facility would comply with all air quality standards before an air quality permit can be obtained.

Regarding the visibility at the Cape Romain National Wildlife Refuge, the level-1 visibility screening analysis (see EIS pages VII.A-21 to VII.A-23) did not indicate that the proposed refinery would cause an adverse visibility impairment at Cape Romain. However the level-1 analysis does not take into account the refinery's hydrocarbon emissions. SCDHEC has the authority to request a more detailed visibility impairment analysis to be submitted along with the PSD permit application.

Although this area does have a higher percentage of stagnant air masses, each new pollutant source applying for permits to construct in this area must be analyzed individually. Based upon air quality considerations alone, any type of industry could locate in this area, given appropriate controls, engineering and management. See the response to comment AR-16.



Construction impacts on marshes are negligible and therefore do not warrant inclusion in the summary. Additional information on the construction impacts to wetlands has been added to page VII.B-112. See the response to comment AR-16.

- AR-19 II.3 (9) Construction impacts on marsh should be mentioned.
- AR-20 II.3 (10) Paragraph 4 fails to mention that while quantitatively the additional pollutants added could be considered "small," qualitatively their impact may be "large." See discussion by U.S. Fish and Wildlife, DEIS p.VII.C-13.
- II.3 (11) The 5th paragraph should note that the reason for language such as "depending upon" discharge components and "expected" discharge components is that over four years after the initial proposal there is still no valid NPDES application filed with the state. This should be clearly stated.
- II.3, 4 (12) The discussion of effluents should clearly state the types of substances which will likely be discharged, including a number which are toxic, persistent, bioaccumulative and some which are carcinogenic and mutagenic. Specifically, the fact that PCB's will be discharged should be mentioned. See Comment (103).
- II.6 (13) Impacts on ground water from high use of same by the refinery for process water should be mentioned.
- AR-21 II.6 (14) Why is it stated that the refinery "would probably" have to comply with the New Source Performance Standards, when throughout the discussions in the detailed text the assumption seems to be made that such compliance will be necessary?
- \$7.a.

The word "probably" has been deleted.

PURPOSE AND NEED

See the response to comment AL-1 regarding the national policy on energy needs and the Corps' position on the economic evaluation of permit applications.

IV.1 (15) The Corps is bound by its regulations, by the National Environmental Policy Act and regulations issued thereunder and by decisions of the courts to establish that the proposed project is in the public interest. 33 C.F.R. §§320.2, 320.4(a) (1983); 40 C.F.R. Part 1500 (1983). That determination is arrived at by weighing public benefits against public detriments. The former can be established by projecting the public need which, among other things, would include consideration of the economic advantages the project promises. But for this to be a practical evaluation, it must be substantiated that the project is needed and be likely to succeed. This requires that facts be gathered and completely analyzed.

In the case of CRDC, the project is said to be necessary to fill the need for refined petroleum products within a 100 mile radius of Georgetown. Secondly, it is supposed to supply jobs and generate tax revenue. However, the DEIS nowhere goes behind these bold statements to provide substantive data. We believe the project may not be needed at all. A recent analysis in Oil & Gas Journal shows that refineries nationwide are running at less than 75% of capacity. Oil & Gas Journal, April 16, 1984, p. 97. During the same period, an industry newsletter ran an article

captioned "Refiners Should Cut More U.S. Capacity, Exec Says." R.S. Toohey, general manager of planning for Gulf Oil Products Co., stated that even with 2.5 million bpd of capacity already shut down, domestic refiners must mothball yet another 2 million 2 bpd before the sector can regain profitability. He said the industry overbuilt because of poor forecasts, and estimated that there could still be surplus capacity of current refineries by 1990. The Oil Daily, March 2, 1984, p.6. Without an exceptional case being made for the Georgetown area, this would not seem to be an auspicious time to be proposing to add additional refinery capacity. That case is not made. There is no information presented to show that petroleum product demand is not now being met in this market, or that a new refinery could profitably displace refiners and suppliers who currently supply this area.

There is also no basis given, and one is not readily apparent, why a 100 mile radius of Georgetown market area was chosen. This market leaves out several important towns (e.g. Orangeburg and Columbia) but includes Charleston, a major port city and the focus of every type of commercial transportation where it is very unlikely that there exists unmet needs.

Finally, even if this is a viable market in which there is an unfilled demand, it may be met by conservation or by investments in alternate

The basis for the market area being within 100 miles of Georgetown is the applicant's belief that he can competitively market refinery products within that area. See also the response to comment AR-8 regarding alternatives.

energy forms, alternatives which should be but are not discussed in the DEIS.

As stated in Comment #4, either the relevant data must be supplied or this statement removed.

#### ALTERNATIVES

AP-24 V.1 (16) The Corps' consideration of alternatives has been limited to South Carolina, presumably because that is the limit of the Charleston District's jurisdiction. However, it is clear that an agency which is preparing a NEPA document's alternatives analysis cannot so arbitrarily curtail its investigations. The discussion of alternatives in an environmental impact statement, mandatory under §102 (2)(C)(iii) of NEPA, is the "linchpin of the entire statement." Monroe County Conservation Council, Inc. v. Volpe, 472 F.2d 693, 697-98 (2nd Cir. 1972). NEPA regulations specifically require inclusion of alternatives outside the lead agency's jurisdiction. 40 C.F.R. 1502.14(c) (1983); Forty Most Asked Question Concerning CEQ's National Environmental Policy Act Regulations, Questions 1, 2, 46 Fed. Reg. 18026, 18027 (1981). Corps' regulations at 33 C.F.R. Part 230 (1983) implement NEPA and include the requirement to investigate out-of-jurisdiction alternatives if reasonable and within the capability of the applicant. 33 C.F.R. Part 230 Appendix B., 11(5)(b)(ii). Case

See the response to comment AP-8.

law has upheld this NEPA policy. Sierra Club v. Lynn, 502 F.2d 43, reh. den., 504 F.2d 760 (5th Cir. 1974), cert. den., 421 U.S. 994, reh. den., 423 U.S. 884 (1975).

For these reasons, the alternatives review throughout the DEIS must at the very least consider sites in Florida, Georgia and North Carolina.

Alternatives of decreasing any need for additional refinery capacity by conservation should be discussed, and there should be a discussion of

the use of alternate energy forms as well.

(16.5) The reference to the Revised Environmental

Assessment should be removed and the description of the pipelines either given here or by reference to another part of the DEIS.

(17) The applicant has proposed a route--that should be stated, and referenced on Figure V.3.

(18) How much marsh, quantitatively, will be excavated/disturbed.

(19) The phrase "market conditions perceived by the applicant" is not explained and nowhere is data provided to describe what those conditions are and how they relate to considerations such as desirability, need and likelihood of success, among others, which must be investigated when siting an costly energy facility. See Comments (4), (15).

Agree. The reference to the "Revised Environmental Assessment" has been deleted.

Agree. Page V.1 has been revised to state that Route 3 is the proposed route and Figure V.3 has been revised to show this.

Approximately 0.1 acre of marsh would be excavated during pipeline construction.

See the response to comment AR-23. See also the response to comment AL-1 regarding the national policy on energy needs and the Corps' position on the economic evaluation of permit applications.

## COMPARISON OF ALTERNATIVES

AR-29 V.7 (20) The first sentence in the second paragraph is inaccurate, as the Corps deleted from the Fish and Wildlife Service's final submittal, Fish and Wildlife Resources of Winyah Bay and Environmental Consequences of the Proposed CRDC Refinery in Georgetown, S.C., the following language found on page VII.C-58 of that document:

### 8. SELECTION OF PREFERRED ALTERNATIVE WITH RESPECT TO FISH AND WILDLIFE RESOURCES (ENVIRONMENTALLY PREFERRED ALTERNATIVE)

The Winyah Bay system is unique and irreplaceable. Its abundant resources are of national significance. In terms of environmental considerations, the Fish and Wildlife Service believes the chosen site represents one of the worst possible sites in coastal South Carolina for an oil refinery. Based on the resources and impacts, the Fish and Wildlife Service believes the proposed project is incompatible with maintaining the ecological integrity, existing uses and abundant fish and wildlife resources of the Winyah Bay system.

The only two alternatives that appear compatible with this goal are permit denial (no action) and building of a larger refinery at Savannah, Georgia. In that this latter alternative would require further detailed analysis to discern impacts on the environment and that it has been previously dismissed as not meeting the applicant's needs, the alternative of choice with respect to fish and wildlife resources is that of permit denial.

The Corps' omission of this section became apparent when the DEIS as initially mailed stated in its Table of Contents on page III.10, indicated that the heading above given would be found at subsection 8 on DEIS p. VII.C-58. However, the text did not appear; instead a half sheet was

The Corps did not make any revisions to the parts prepared by cooperating agencies without first consulting them. In this context, we believe the sentence cited in this comment is accurate. See the response to comment AL-5 regarding the Corps' impartial position on permit actions.

left blank. The Table of Contents was subsequently revised on 4-12-84 and this reference removed.

Either the section must be included or it must be stated here that it was submitted and rejected by the Corps.

(21) The second paragraph states that the Corps' evaluations of impacts in Table V.1 "appears less than stated elsewhere" as to water and living resources. "Appears" must be changed to "is" for the sentence to be accurate.

We believe the meaning of the reference paragraph is clear enough, and that any improvement to be gained by changing "appears" to "is" is not sufficient to justify revising a page in the EIS.

(22) The Corps rationale for overriding the professional opinions of the resource agencies it contracted with to provide expert analysis is not found persuasive for the following reasons:

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

a. The DHEC PSD air permit is no longer valid, its data is old and therefore cannot be relied upon. A new permit application will have to be filed.

b. DHEC's \$401 Clean Water Act Certificate of Non Degradation could not have included any consideration of impact other than that of the emplacement of the two pipe lines. It is

AR-30 V.7

AR-31 V.7  
§1.

- of no value in determining impacts from spills, non-point source pollution, or pollution from construction or operation of refinery or from NPDES-regulated effluents.
- c. The SCCC consistency determination is being contested in court.
- d. The WRC recommendation to the Budget and Control Board is currently under study by a specially appointed committee of the WRC because of new information as to impacts presented in the DEIS. It is likely that the WRC may rescind its recommendation or send additional information to the Budget and Control Board for it to consider.
- e. The NPDES permit application cannot be relied upon to overturn EPA or F&WS comments. It is now out of date and the application for the permit will have to be substantially revised. DEIS p.II.6. In fact, the original application was submitted November 13, 1979, and no new information has evidently been supplied DHEC since at least September 16, 1981, when the draft permit was issued without any public input. DEIS p.VI.C-5.



AR-20

V.7

(23) The Corps of Engineers has no expertise in the biological impact of pollutants. For that reason

¶2.

it contracted with the U.S. Fish and Wildlife Service. They found that there would definitely be degradation and depending on the location and the operational item under consideration, the impacts would range from minor to calamitous. No sound rationale is given for the Corps' disregard of their experts information. For instance, no basis is given for Table V.1's failure to mention NMFS's biological opinion which states that "the proposed CRDC refinery is likely to jeopardize the continued existence of the southern population of the [endangered] shortnose sturgeon." DEIS VII.C-48; see also p.VII.C-13. The Corps' statements appear on page V.7 and in Table V.1 to be wishes, scientifically unsupported, which fly in the face of reality. As such, they must be excised.

P-81

AR-32

V.7

(24) It is important that it be made clear that a

¶3.

likelihood of an occurrence "once in 100 years" does not mean that it will occur only in the 100th year. It could just as easily come in the first year of the period; thereafter the risk would be that it would not recur for 100 years.

See response to comment AR-31. See also the response to comment AI-2 regarding the Corps' compliance with the Endangered Species Act.

See the response to comment AC-2 regarding the deletion of material on page V.7.

AFFECTED ENVIRONMENT  
AIR QUALITY

AR-34 VI.B-7 (25) Given the statement at the top of this page and the fact that air stability information is lacking for Georgetown but may be more stable than other locals, how accurate are the conclusions about polluted air dispersion?

AR-35 VI.B-7 (26) Given the conclusions of the 3rd paragraph, wouldn't South Carolina and Georgia be bad places to locate industries with air pollution potentials when compared to areas with lower frequencies of stagnant air masses?

AR-36 VI.B-11 (27) Are complete direct and synergistic impacts of refinery air pollution determinable if there is no knowledge of the current levels of carbon monoxide, non-methane hydrocarbons, gaseous flourides and lead in the Georgetown area?

AR-37 VI.B12 (28) Special attention should be given to any impact any industry could have on the Cape Romain National Wildlife Refuge, the only Class I Air Quality Area for PSD in South Carolina.

AR-38 VI.B-14 (29) It is unclear what the last sentence contributes to the information needed for the public to understand the impact of the refinery on air quality.

It should be mentioned that the refinery may consume more than the remaining 24-hour SO<sub>2</sub> increment, and as well violate hydrocarbon and ozone standards in Georgetown and Cape Romain as well as degrade visibility at Cape Romain. DEIS VII.A17, 19.

The analysis in the DEIS used meteorological conditions that would result in the highest calculated pollutant concentrations. Meteorological data collected at nearby sites at Charleston and Myrtle Beach indicate that the Georgetown area has a high potential for stable conditions. The results of this analysis should give a good indication of the maximum impact that may be expected from the proposed facility.

Air pollution potential is only one of many considerations that determine the suitability of any site for industrial development. This question can not be answered unless specific sites are provided for comparison of all potential impacts of industrial development.

Complete impacts of any proposed project cannot be determined regardless of the size and completeness of available data bases. The discussions and conclusions presented in this document are based on available information.

The discussion of potential impacts on the Class I Cape Romain area are sufficient. In the absence of specific comment on this issue, further discussion is deemed unnecessary.

We do not believe the last sentence on page VI.B-14 requires clarification or explanation. See also the response to comment AR-2.

# **SURFACE WATER**

- AR-39 VI.C-5 (30) Mention should be made of the fact that CRDC has not made application for a RCRA permit although it is clear that one will be necessary. See Comments for October 8, 1981, Joint Public Hearing on CRDC Application Submitted by Friendfield Plantation et al (hereinafter, 1981 Comments) pp.80-82.
- AR-40 VI.C-7 (31) Mention should be made that there has been no §404 Clean Water Act permit application filed by CRDC although one is clearly necessary.
- AR-41 VI.C-14 (32) Water quality information spoken to in the 4th paragraph should be updated to use 1982 or 1983 data, especially since tables following this discussion use 1983 figures.
- AR-42 VI.C-15 (33) It would be very helpful if the location for the proposed refinery was shown on Figure VI.C-3.
- AR-43 VI.C-18 (34) Table VI.C-7 is incomplete as to a number of pollutants which the refinery could discharge in its effluent. They should be added. See Table VII.B-10.
- AR-44 VI.C-22 (35) Any summary giving impacts which are related to actions of sediments must point out the statement here that sediment transport field sampling has not been done.
- AR-45 VI.C-23 (36) Any summary giving impacts which are related to actions of sediments must point out the statement here that sediment transport field sampling has not been done.

The requirements for a RCRA permit are addressed on page VI.C-5 and indicate that compliance with existing regulations should prevent any significant adverse impacts from hazardous wastes. The EIS states that a RCRA permit would be required. We do not see how knowing whether or not one has been applied for would facilitate the environmental evaluation of this permit application, and do not believe that there is sufficient justification for adding this information to warrant replacing another page in the EIS.

This part of the EIS has been revised to delete the reference to a Section 404 permit since one is not required.

Water quality assessments for the years 1982 and 1983 are now being prepared at the South Carolina Department of Health and Environmental Control; they were not available in time for inclusion in the final EIS.

The refinery site is shown on Figure VI.C-2 and other figures, and can readily be transcribed to Figure VI.C-3. We do not believe the recommended change justifies issuing another revised page to the EIS.

Table VI.C-7 has been changed to include the complete list of expected effluent components.

See response to comment AR-16.

AR-45 VI.C-24 (36) It must be noted that overall water quality assessments for Winyah Bay are not given after 1981. This is an important lack since there may be a trend toward improvement in quality, which trend would be reversed by the refinery.

AR-46 VI.C-25 (37) Any summary which speaks to conclusions based upon hydraulic properties must point out that there is no acceptable, calibrated, mathematical model of these characteristics for Winyah Bay.

VI.C-27 (38) The same is true as to the lack of comprehensive studies of the flushing characteristics of the Bay.

VI.C-28 (39) It should be emphasized that, contrary to some public perception and statements by the applicant, baseline measurements show the Bay to be very clean relative to oil concentrations--more typical in fact of offshore waters than industrialized estuaries. DEIS p.VII.B-93.

AR-47 VI.C-31 (40) It should be stated that studies have predicted that sheltered tidal flats and salt marshes--low energy areas such as Mud Bay--may retain oil sediments for up to 100 years. 1981 Comments, p.90.

AR-48 VI.C-35 (41) Natural swamps and freshwater wetlands act as sediment traps and should be mentioned in line 7.

AR-49 VI.D-3 (42) Is the size of the Baruch properties correctly stated?

See the response to comment AR-41.

See response to comment AR-16. In addition to the statement on page VI.C-25, a caveat on the lack of an acceptable model for the analysis of pollutant movement through Winyah Bay has been added to page VII.B-26. The lack of detailed studies of the flushing characteristics of Winyah Bay is adequately stated on page VI.C-27.

A statement that petroleum hydrocarbons measured in Winyah Bay were more typical of continental shelf waters than of industrialized estuaries has been added to page VI.C-28. However, the limitations of these measurements (top 20 cm of the water column only) also were emphasized, along with the propensity of oil to disappear rapidly from the water column and to become substantially incorporated into the surface sediments.

Spilled oil may have long term adverse impact but it is felt that the section on pollutant assimilation capacity in sediments (page VI.C-31) sufficiently addresses the long-term persistence of oil in sediments in low energy environments. In the absence of site specific studies in Winyah Bay, it cannot be stated with certainty that these areas may retain oil in sediments for up to 100 years. This uncertainty was emphasized under Data Limitations on pages VII.B-92 and 93. There it was stated that both laboratory and field work would be needed in the Winyah Bay system to "sufficiently upgrade predicted impacts of accidental spills beyond the realm of qualitative judgement and inference.... Additionally the longevity and persistence of incorporated Venezuelan crude oil are unknown for different conditions." It is further stated in this section that "sufficient understanding of environmental consequences exist...to allow public officials to reach a reasoned decision with respect to the permitting of the proposed refinery."

The suggested addition has been included in a revision of page VI.C-35.

No. Page VI.D-3 has been revised to show the correct size of the Baruch property.

# SOCIO-ECONOMICS

AR-50

- (43) This section, which should address the demand/need/public benefit aspects of a refinery and define its 100 mile radius market, does not. The only statement vaguely related is 7 lines on page VI.F-11, which provides no relevant information. See Comments (4), (15).

AR-51

- VI.F-10 (44) The exact location of the Georgetown County Water and Sewer District wells vis-a-vis the proposed refinery and pipeline routes is necessary in order to consider possible impacts from spills and operations.

AR-52

- VI.F-14, (45) Much of the economic data is old, and therefore not useful to obtain a picture of the current status of the area. For instance, income table VI.F-5 uses 1969 and 1979 figures. This must be updated. See 1981 Comments pp. 69-75 and Appendix C thereto.

AR-53

- VI.F-17 (46) Seafood landing values are understated. The value of recreational landings must be included. Using South Carolina Wildlife and Marine Resources data, we computed values of twice that given here for commercial and recreational use. Hunting and fishing license fees and monies collected by hunting preserves also must be included. 1981 Comments, Appendix C pp. 17-18.

AR-54

- VI.F-17 (47) Using 1978 employment figures greatly limits the value of conclusions based thereon.

See the response to comment AL-1 regarding the Corps' policy on the economic evaluation of permit applications.

The well nearest to the refinery site is located near the crossing of Pennyroyal Road by Turkey Creek. Many of the factors that can make an oil spill on water very difficult to control and clean up are not applicable to land spills. Such spills are not susceptible to spread by tides and wind, and various kinds of equipment can be readily brought into operation to control the spread of oil and clean up all spilled oil in a relatively short time. Because of the relative ease with which spilled oil can be retrieved plus the great improbability of a large spill ever occurring, we do not believe it necessary to show the exact location of wells.

It is Corps policy to use OBERS projections developed by the U.S. Department of Commerce because of the expertise and jurisdiction of that Department. These projections were published in 1981 and are the most recent OBERS projections. In this particular example, 1969 and 1978 data are used only to establish a trend for predicting the future.

Page VI.F-17 has been revised to show commercial fish statistics submitted by the National Marine Fisheries Service expressly for this EIS. A dollar value has not been established for recreational fishing, but as noted on page VI.D-29, recreational fishing pressure in Winyah Bay is low in comparison to other major estuaries in South Carolina. Since this section deals with seafood landings, data on hunting and fishing license fees is not relevant and is not included.

The latest economic data available at the time of preparation of the draft EIS was used. See also the response to comment AR-52.

AR-52 VI.F-18 (43) It should be stated that additional costs would be associated with the use S.C. 42 by tanker trucks is shown on page VII.D-1.

17.d. refinery vehicles. A June, 1981, study for the South Carolina Coastal Council estimated that necessary upgrading of the 9.9 miles between U.S. 17 and 17A would then cost \$732,000. Bruce J. Muga & Associates and Wilbur Smith & Associates. An Evaluation of the Environmental Assessment Documents for a Proposed Refinery, Georgetown, S.C., pp. 42-43 (1981). If the road were made 4 lane, costs would be \$5 million. 1981 Comments, Appendix C.P.20.

AR-56 VI.H-1 (49) Substantiation should be provided for the statement that the refinery's operational noise levels will be in the range of 10-20 decibels.

AR-57 VI.H-1 (50) What is the period of record referred to here as to the heaviest one-day rainfall?

AR-58 VI.H-1 (51) What is the maximum height of storm surge which could be predicted for Winyah Bay and would such a surge carry to the refinery site?

AR-59 VI.J-1 (52) There is no mention that before any Corps permit can be issued, consultation (which has not yet occurred) must be carried out under the National Historic Preservation Act of 1966. 16 U.S.C. §470. See 1981 Comments, pp. 57-59.

AR-60 VI.J-2 (53) Figure VI.I-1 incorrectly locates the proposed

The referenced paragraph concerns existing noise levels at Harmony Plantation and not the noise levels of the refinery.

We do not believe that knowledge of the period of record for rainfall records would be helpful in an environmental evaluation of the proposed oil refinery.

Page VII.H-1 has been revised to show that a category 5 hurricane could have a storm surge 20 feet above mean sea level which would not be high enough to affect the refinery.

See the response to comment AD-1 regarding the lack of impact to cultural resources.

Figure VI.I-1 has been corrected.

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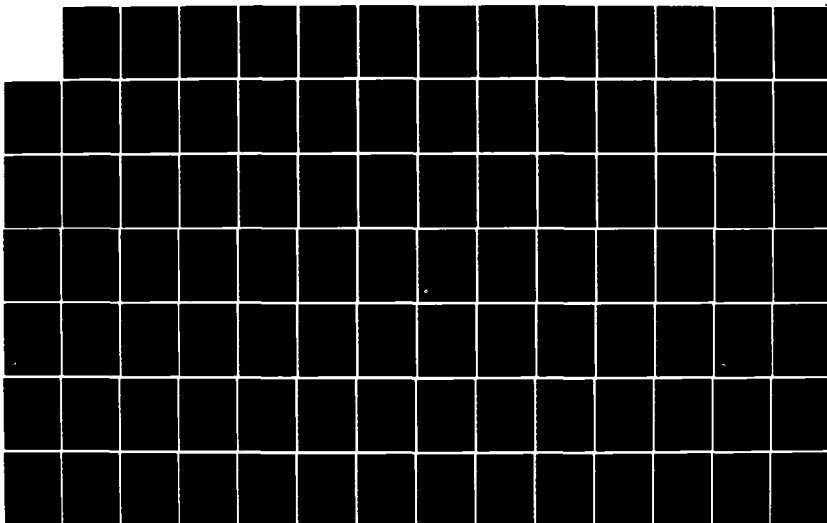
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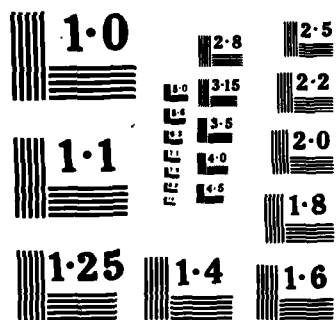
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refinery site.

AR-61 VI.J-4 (54) There should be specific discussions as to locations and amounts of use of current or potential water district and private wells, as well as of current and potential use of shallow ground water uses. This would then allow there to follow an assessment of ground water impacts due to any refinery activities, including rail and highway transportation of crude, intermediate or finished products.

AR-62 VI.K-1 (55) Values of income from the work at the Hobcaw Barony are underestimated, failing for instance to incorporate grants received to carry on research. No value is given for the annual expenditures of the Tom Yawkey Wildlife Center. Both errors should be remedied.

#### ENVIRONMENTAL CONSEQUENCES

AR-63 VII-1 (56) There is no detailed description of construction standards, for either the pipeline or the plant anywhere in the document. Such details are necessary before environmental consequences can be fully appraised.

AR-64 VII-3 (57) Will any wetlands be affected?

1a. (1)

The probability of significant ground water impacts due to refinery activities does not appear to warrant inclusion of the recommended detailed information on current and potential uses of ground water.

The amount of grants received by the Baruch Institute has been added to page VI.K-1 and the annual expenditure of the Tom Yawkey Wildlife Center has been added to page VI.K-2.

The EIS has been predicated upon all pertinent information that was available to the preparers. While the use of incomplete data may preclude a full appraisal, it is felt that the detailed analysis of the available information has provided sufficient understanding of environmental consequences to satisfy the purpose of the NEPA process; i.e., to help public officials make decisions and take actions that protect, restore and enhance the environment. It is pertinent to note that the environmental impacts of construction activities are expected to be relatively minor and temporary.

Localized effects on wetlands are expected. Additional comments on this subject have been added to page VII-3.

- AR-65 VII-3 (58) How accurate a prediction of impacts can be made when there is no final design? This should be stated.
- AR-66 VII-4 (59) What are the impacts from the direct discharge without treatment of waters which are not reusable at the plant, e.g. effluent from boiler blowdown and cooling tower blowdown?
- AR-67 VII-4 (60) What is the applicant's proposed point of discharge for NPDES effluent?
- VII-4 (61) How are the wetlands affected by the NPDES discharge system in the applicant's preferred location; in others discussed here?
- AR-68 VII-4 (62) Again, is it possible to fully evaluate the project when there is not even a current location for the NPDES discharge system, much less a current application and permit setting out what pollutants will be contained in the effluent?
- AR-69 VII-5 (63) Mention is made of land application and deep-well injection as alternate ways to dispose of effluent. There does not seem to have been any site specific investigation as to whether those would be workable solutions here. That should be made clear.
- AR-70 VII-8 (64) Have hydrocarbon emissions from tankers, mentioned here, been added to and considered in total hydrocarbon emissions generated by this project? If not, they must be incorporated.
- VII-8 (65) What are the implications for air quality impacts from the fact that pollutants, constituents and amounts, emitted from ship boilers, are not known?
- We believe the accuracy of impact predictions is sufficient to enable the Corps to determine whether or not it is in the public interest to grant this permit.
- The quantities, constituents and effects of direct discharges including boiler and cooling tower blowdowns are discussed in greater detail in additions and revisions on pages VII.B-13, VII.B-17 and VII.B-112 and in Table VII.B-7.
- As indicated on this and other pages, the point of discharge has not yet been determined. Wetlands would be temporarily affected by construction of the discharge system.
- Yes, see the response to comment AR-65. The nature of pollutants and their potential impacts are discussed in great detail in Section VII.B.
- Land application and deep-well injection were discussed as possible methods of wastewater disposal, but their use was neither proposed nor evaluated. We believe the discussion of this in the EIS is sufficiently clear.
- Hydrocarbon emissions from cargo transfer (ballasting) at the docking terminal have been included in the total emission rate for the facility. These emissions will be controlled using the facility's vapor recovery system.
- As a consequence of permitting the refinery, it is anticipated that an additional 78 tankers per year and a possible but undetermined number of barges would use the Georgetown port facilities. The pollutant constituents and quantities emitted from the vessel's boilers have not been determined. However, this should not constitute a significant increment to air pollutants at Georgetown.

# AIR QUALITY

AR-71 VII.A-1 (66) Again, lack of detail relative to construction prevent evaluations of impacts.

VII.A-1 (67) Measures referred to as mitigative should be in the proposal of any conscientious applicant, and should not have to be alluded to, proposed or demanded by permitting agencies.

AR-72 VII.A-1 (68) There seems to be no discussion of the amounts and types of emissions from port activities associated with this project. This must be remedied.

See the response to comment AR-63.

See the response to comment AR-63.

AR-73 VII.A-3 (69) What assurance is given, since there is no design for the refinery, size, design that the process estimates given by CRDC's second consultant will in fact be those used? Given this uncertainty, is the discussion here any more than one about a generic 30,000 bpd refinery which will produce the end products currently projected by CRDC?

Assurances have been received from the applicant's consultant and the applicant that the process scheme shown in Figure VII.A-1 and the process data given in Table VII.B-8 represent the expected process configuration related for the proposed Georgetown refinery. There are still many engineering decisions to be made prior to the construction phase but these presumably would be predicated upon the basic process configuration as stated. Therefore, although there are many details still lacking from the final design characteristics, the EIS process has addressed more specific characteristics than would be the case with knowledge only of the throughput capacity.

AR-74 VII.A-6 (70) The design of the vapor recovery system outlined here has apparently not been changed since our 1981 Comments. At that time, this proposal was criticized by our consultant, Robert Rittmeyer, as posing significant fire and explosion risks. Mr. Rittmeyer of Environmental Research and Technology, Inc., Pittsburgh (ERT is employed by almost all of the major refiners and the API), noted that these risks are difficult to abate even when state-of-the-art practices are used. He did not feel CRDC proposals represented SOTA design. 1981 Comments, Appendix B pp.6-9.

The vapor recovery system described on page VII.A-6 of the DEIS was considered State of the Art at the time it was proposed by Davis and Floyd Engineers, Inc. It was part of the air quality permit application which was approved and permitted by DHEC. However, before construction begins, State of the Art equipment and systems will be reviewed and updated and incorporated into the final refinery design.

AR-75 VII.A-7 (71) Hydrogen sulfide will be emitted by the refinery. As this a component in the process of the creation of acid rain, a now widely recognized environmental problem of industrialization, that should be pointed out here.

Although hydrogen sulfide is very toxic, its principal concern is within contained work areas since it is readily ionized in the atmosphere. The oxides of sulfur and nitrogen, also emitted by refineries (see pages VII.A-7 and VII.A-8), are implicated as the most common precursors of acid rain. However, a study of sources and effects of acid rain is beyond the scope of this EIS, and since these emissions from the proposed refinery seem relatively small, constituting less than one tenth of one percent of existing emissions, no discussion of acid rain implications is included in the text. A letter from Ford, Bacon and Davis to the U.S. Army Corps of Engineers dated 15 May 1984 is germane to the problems of H<sub>2</sub>S and SO<sub>2</sub> emissions and also discusses that of VOC (volatile organic compounds) emissions. Since it was only recently received, there was no attempt to incorporate its discussions into the final EIS text, but it has been appended to this comment section.

AR-76 VII.A-8 (72) It is stated that there is no data regarding amounts, constituents and sizes of refinery generated particles. Is this lack peculiar to this refinery or is it a lack industry wide? If it is the latter, how are estimates, including those for delayed coking, made? How accurate are they likely to be?

For specific oil refining techniques, which are dependent upon type of crude processed and type of end products desired, data are available regarding amounts, constituents and sizes of refinery generated particles. Without final design specifications, however, individual process emissions from CDC's proposed refinery are difficult to quantify.

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AR-77 VII.A-8 (73) Based upon Comment (70), it currently does not seem to be justifiable to reduce uncontrolled VOC emission rates from 4121.4 to 1,888.2 metric tons/year. Conservative impacts should be predicted based upon the higher figures unless the ERT criticisms can be met and defeated. A design of this nature and importance should not be accepted on faith, especially in light of the seriousness of ERT's concerns.

See the responses to comment AR-74 regarding the design of the vapor recovery system and to comment AR-84 regarding the requirements the applicant must meet to obtain the necessary air quality permit.

AR-78 VII.A-10 (74) The "in summation" statement recognizes that air emissions are only generally characterized since there are no specific process design parameters. This must be clearly noted in any summary of this information used elsewhere in the DEIS.

See the response to comment AR-16 regarding the purpose of summaries.

A2-70 VII.A-10 (75)

What are the confidence intervals, the levels of certainty, of the conclusions drawn about air quality impacts? This is important when there are "potential emissions estimates" based upon "no specific process design parameters" in an area where certain meteorological data is not available, but where stagnant air masses occur with great frequency. Elsewhere it is stated that the analysis will be a worst case one, but we have already pointed out in Comment (73) that it is not such, at least for one design factor about which we have obtained expert advice.

A2-80

VII.A-11 (76)

1c.

The CRDC air permit referred to is no longer valid. The data used to prepare the Pre-Construction Review and Preliminary Determinations is out of date. The impacts to Cape Romain should be reevaluated because in the elapsed period between 1979 and the present, new industry has moved into the area.

VII.A-12- (77)

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Data used to prepare the Muga report is out of date; this report was subject to much criticism at the time it was presented. See 1981 Comments p. 55-56.

The analysis performed used meteorological conditions that would result in the highest calculated pollutant concentrations. See the response to comment A2-34.

The discussions on pages VII.A-11 through VII.A-13 were written to provide background information on previous air quality studies conducted for the proposed refinery and to arrive at the conclusions stated on pages VII.A-13 and VII.A-14. It was acknowledged that the air permit is no longer valid and the conclusions state that "Because of the increases in the estimated proposed emissions, changes in air quality regulations and changes in the ambient conditions in the Georgetown area, an additional air quality analysis was warranted."

AR-82 VII.A-17 (78) The analysis shows that even with the Best

Available Control Technology used (and presumably working optimally) the plant could consume more than the remaining 24-hour average SO<sub>2</sub> increment for both Georgetown and the only Class I area in South Carolina, Cape Romain. This is clearly stated about Georgetown, but the last sentence on this page must be corrected so that "more than" is inserted between "the" and "remaining" as to Cape Romain. What impact would that have as far as both areas currently being attainment areas; as far as a future industry being able to locate in Georgetown; as far as environmental and human health concerns?

AR-83 VII.A-19 (79) Emissions of hydrocarbons, even when figured at the lower rate of 1,888 meter tons per year, §(f) could cause a violation of hydrocarbon and ozone standards down wind from the facility. How far downwind would this violation trail extend? Wouldn't it reach Cape Romain? What are the anticipated environmental and human health impacts? What are the answers to the above questions if the rate of 4121.4 meter tons/year is used? All these questions should be clearly addressed in the document.

AR-84 VII.A-19 (80) Again, the summary should be rewritten. It must state "...consume more than the..." (instead of "all of"). §(g)

Appropriate changes have been made on page VII.A-17.

If the proposed facility were to be built and the allowable increments for SO<sub>2</sub> consumed, options are available that would allow other industries to locate in this area. These include having an emission rate that would not be classified as a major source, and applying for emissions credits through the emissions banking policies. In any event, SCDHEC would not allow the area to become non-attainment for any of the regulated pollutants.

The lack of specific hydrocarbon emissions characteristics does not allow the analysis to fully quantify the magnitude and extent of the hydrocarbon impact. These concerns would have to be addressed as part of the facility's PSD permit application.

The DEIS states on page VII.A-14 that an air quality analysis based on specific process emissions and final design is required as part of the permit application and permitting procedures. Ambient air quality monitoring prior to submitting the new permit application may also be required. A permit cannot be obtained unless the analysis shows that all air quality standards will be met and no established increments will be exceeded.

- AR-85 VII.A-19 (81) When would the "more detailed study with specific information and data" which is necessary before air impacts can be accurately defined be performed?
- AP-86 VII.A-21 (82) In the third paragraph, the second and third sentences state that CRDC emission for sulfur and nitrogen oxides and particulate matter are not expected to impact local air quality and thus, "in the absence of other contributing sources," there is only a minimal potential for synergistic effects. Does the quoted phrase take into account the current type and level of pollutants in Georgetown's air?
- AR-87 VII.A-21 (83) Given the fact that hydrocarbon emissions may greatly exceed the figure used by EPA in its analysis, there needs to be further analysis of the impact of the refinery on visibility at Cape Romain. This, if not done, should at least be clearly stated as necessary. Currently, one paragraph on page 23 says it is not necessary; another says that it may be.
- VII.A-23 (84) This discussion indicates that there every reason to believe that there are increased health risks to workers in and residents living around refineries. See also 1981 Comments pp. 56-57.
- 27

As part of the PSD permit application, the applicant is responsible for submitting a detailed air quality analysis that shows that there will be no violations to any NAAQS or PSD allowable increment and that it does not significantly impact any Class I Air quality area. This permit application would be submitted to SCDEC before construction approval could be given. This will probably be done only if the applicant receives a Department of the Army permit for the underwater pipelines.

The conclusions of the referenced paragraph were based on the results of adding the proposed facility's calculated maximum concentrations to the actual monitored concentrations at Georgetown's water tank monitoring station (1982 data, see page VI.B-7). Adding these values together, the resulting values are below the NAAQS which protects the public health and welfare.

As stated in the text on page VII.A-23, the Level-1 visibility screening test indicated that further analysis of potential visibility impacts on the Cape Romain National Wildlife Refuge would be unnecessary. This is in accordance with the USEPA guidelines promulgated in the Workbook for Estimating Visibility Impairment. However this analysis does not take into account hydrocarbon emissions which may contribute to visibility impairment. SCDEC has the authority to request a more detailed visibility impairment analysis to be submitted along with the PSD permit application.

Before permitting, a detailed air quality analysis will be required as discussed in the response to comment AR-85.

AR-89 VII.A-26 (85) It is also commendatory that EPA acknowledged §(e) that "the effectiveness of the proposed emission control strategy on occupational exposures can only be assessed after presentation of more detailed plans and specifications." This statement would be true as to the community at large as well. The question is, will there ever be a complete assessment and thus full disclosure of potential impacts, since the plant will be permitted based upon what is now available?

AR-89 VII.A-28 (86) The DEIS seems to indicate that inevitably there will be odors. Again, the Corps' summaries (and oral presentation) fail to mention this.

Page VII.A-29 has been revised as suggested in this comment.

AR-90 VII.A-29 (87) The first paragraph in this discussion should note the assumptions which have been used and restate that there is no final design for any of the refinery processes.

See the responses to comment AR-84.

AR-91 VII.A-30 (88) The third paragraph should be corrected to read that SO<sub>2</sub> emissions could consume "more than" the remaining 24-hour increment.

See the responses to comments AR-74 and 77. An assumption basic to all design procedures is that they will in fact work as designed.

AR-92 VII.A-30 (89) The final paragraph should note that this low figure is attainable (if at all) only if the

vapor recovery system works as designed, which is the subject of much disagreement in the industry.

AR-93 VII.A-31 (90) This page makes it clear that air quality will be decreased by the refinery. It does not state that the quality of the natural environment will and human health conditions may also be degraded, which it should.

The first sentence of this section makes a clear statement that the quality of the natural environment would be degraded. The text has also discussed potential health risks associated with degradation of air quality.



# WATER QUALITY

VII.B-1 (91) See Comment (56)

AR-94

Why is the EPA having to guess at what the techniques will be and therefore what the impacts might be? Why is there no plant design and construction proposal over four years after the application was filed if this is a serious proposal by a qualified applicant?

VII.B-2 (92) How can this application even be considered where the law requires a determination of the project's impacts when the analysis agency must make a statement such as "all of these parameters, which alter the quantity or quality of the various discharges, combine to make quantitative predictions of pollutant discharges impossible until the locations and methods for construction are specified?"

VII.B-7- (93) These "mitigative measures" should be in any good design.

VII.B-11 (94) Why is there uncertainty as to whether oil tankers will discharge ballast water when docking at Pier 31?

VII.B-12 (95) Table VII.B-4:

Why is oil-contaminated sewer fn 3 not sent through an API separator before being discharged? Why are oil contaminated sewers fns 3 and 4 not treated to aeration/flotation? Why is location of discharge given as "bay" when that is the least likely location?

AR-96

The applicant chooses not to invest money in further design until a permit has been granted. The DEIS contains a great deal of information available from past studies by various State agencies. Although a final refinery design has not been developed, the nature and quantities of pollutants can be estimated with sufficient accuracy from the New Source Performance Standards that the refinery will be compelled to meet and from information based on other refineries provided by the applicant's consultants.

All details regarding the operation of the refinery have not been determined. Ballast water is simply listed as one of the possible sources of wastes.

The information presented on Table VII.B-4 was provided by the applicant's engineering consultant. The basis for selecting the types of refinery treatment was a review of refinery experience and performance of various treatment methods. The discharge location was reported by the applicant as being the bay. However the applicant also stated that at least two receiving waters were being considered, but that selection of a particular outfall location cannot be determined at the present stage of design. Accordingly references to "bay" in Table VII.B-4 have been changed to "receiving water body."

AR-97 VII.B-13 (96) Table VII.B-5 is cited in the fourth paragraph as being the work of Ford, Bacon and Davis (1982), but the table lists its source as being Taggart (1983). Which is correct?

AR-98 VII.B-13 (97) Does the fact that EPA must decrease the concentrations of pollutants in the refinery discharge waters as provided by the refinery's own consultants call into question the reliability of other information supplied by those consultants?

AR-99 VII.B-13 (98) One reason for the EPA's reduction is stated as being greater treatment, e.g. aeration/flotation, of the effluent. But, Table VII.B-4 notes that only 125,000 gpd will be so treated. This apparent inconsistency should be remedied. The fourth paragraph states that the EPA is reducing the levels for total dissolved solids in blowdown waters, etc. from levels provided by the applicant's consultants. No reason is given for this; one should be provided.

AR-100 VII.B-13 (99) The next-to-last sentence emphasizes that solid waste will be kept on site at an approved land fill. Please explain how this can legally be accomplished and for what periods of time such waste will be retained.

Both. Taggart is the Ford, Bacon & Davis employee responsible for preparing the table.

In response to a request for information on effluent composition, the applicant's consultant provided information based on an earlier refinery design since the final design for this particular refinery has not yet been completed. Consequently it was necessary to adjust the effluents to comply with more recent regulations.

Several errors relevant to this comment were discovered, requiring changes in the text from page VII.B-11 through page VII.B-25 and to Tables VII.B-7 and VII.B-10.

The sentence referred to on page VII.B-13 does not state that the approved landfill facility would be "on site." Nevertheless the sentence has been changed so that this cannot be misunderstood. Retention of solid wastes at an off-site landfill is regulated by the Resource Conservation and Recovery Act (RCRA), which is discussed on page VI.C-5.

AR-101 VII.B-17 (100) There should be a statement that no RCRA permit application has been made. If there in fact had been one, Comment (99) would be unnecessary. See 1981 Comments pp. 80-83; Appendices A., B.

The impacts of loss into water of hazardous waste stored on location is never discussed. This should be corrected.

AR-102 VII.B17 (101) The third paragraph again states treatment of effluent by aeration/flotation in conflict with Table VII.B-4 supplied by CRDC's consultants.

AR-103 VII.B17 (102) The final paragraph states in line 9 that the "size factor" is known and used in computations. However, on page VII.B-10, the first sentence in the third full paragraph indicates that "sizing of facilities" is not yet known. Is this the same "size?" Please clarify.

B-97

AR-104 VII.B-22 (103) Table VII.B-10 reveals that included in the constituents of the refinery effluents in addition to oil and grease (which may contain toxic, mutagenic and carcinogenic components) are substances which are toxic or are converted to such in the environment. Many of these are persistent and bioaccumulative. While some of these constituents, such as phenanthrene and pyrene, are only expected to be carcinogenic, the wastewater will contain PCB's, very toxic, highly bioaccumulative, known carcinogens. (This is especially important as the levels at which PCB's will be introduced by the refinery are greater

See the response to comment AR-39.

See the response to comment AR-99.

The "size factor" discussed on page VII.B-17 pertains to a numerical factor that is used in the computation of effluent limitations as contained in 40 CFR Part 419. This size factor is based upon the proposed feedstock flow for the refinery, which is 30,000 bpd. The reference on page VII.B-10 to sizing of facilities refers to the physical size of buildings and other works that is useful information with regard to runoff considerations.

The federal water quality criteria are the guidelines by which the substances of concern in this comment would be regulated by the state of South Carolina, because they are specifically exempted from regulation by the federal effluent limitations (see page VII.B-20). The statement in this comment that the PCB discharge levels reported in Table VII.B-10 are greater than that recommended for aquatic life is true. By applying the dilution factors given in the new Table VII.B-11, the daily average concentration of PCBs from the maximum reported discharge concentration of 10 µg/l would range from 0.0020 µg/l to 0.040 µg/l assuming no loss from the water column; the 24 hour average value for aquatic life criteria for saltwater is 0.03 µg/l. Thus for the case of an outfall in node 31 (see Figure VII.B-1), the applicable water quality criteria could be exceeded in nodes 31 and 30 by 0.010 and 0.006 µg/l, respectively. However, the aquatic life criteria for freshwater (0.014 µg/l) would be applicable about 10 percent of the time, based upon STORET water quality data for 1981 through 1983, when freshwater conditions predominate in the lower sections of the Sampit River. In this case, water quality criteria could be exceeded in nodes 31, 30 and 21 by 0.026, 0.022 and 0.004 µg/l, respectively. These exceedences, while small, are in the same order of magnitude as median tolerance limits to PCBs reported for *Acartia tonsa*, an important food organism in the Sampit River and Winyah Bay area (Zilliox, E.J., E.F. Corcoran, M.R. Reeve and L.L. Farmer, 1975). Uptake, concentration and biological effects of several ecologically important organo-chlorine substances through a simple marine food chain. Final Report to Environmental Protection Agency, EPA Grant No. R-800352, University of Miami, Miami, FL).

than that recommended for aquatic life. DEIS p.VII.C-17.) The magnitude of the elements discharged and their natures should be set out in the text and in the summaries.

A-2117 VII.B-26 (104) The DEIS states that the extent of degradation of the receiving water depends on a number of elements including a dilution factor. While outfall location alternatives are stated elsewhere to include Pennyroyal or Turkey Creeks (e.g. DEIS VII-4; VII.B-30), their dilution or degradation potentials of these waters are not considered here. This must be remedied by either a finding that these creeks are not suitable locations or by reporting the potential impacts upon them.

A-2117 VII.B-27 (105) There is insufficient treatment of PCBs/hazardous waste impacts.

A-2117 VII.B-28 (106) The DEIS states that sanitary waste water impacts on the receiving water will be great if the water is not treated. The DEIS continues to state that this estimate is based on a "conservative" assumption of the release of the receiving waters. It is noted that, because of complex hydrology and the potential for accumulation of sanitary waste water impacts, it is not possible to quantify effectively the impacts in a quantitative manner of saying that the sanitary wastewater impacts are unknown. At the very least a portion of this discussion should appear in summaries of water-related impacts.

The use of Turkey or Pennyroyal Creek as a direct receiving water for the refinery effluent is possible, although discharge directly to the Sammit River would be a better route. Available information on the hydraulic properties of these creeks is not sufficient to adequately conduct a detailed assessment of wastewater discharge impacts. The need for additional hydraulic studies was indicated previously on page VII-4. Due to the relatively low flow and flushing characteristics of these creeks, it could be assumed that impacts on the water column and sediments would be significant.

See the response to comment AP-36.

The discussion of sanitary wastewater impacts on page VII.B-34 has been modified by the addition of a new paragraph that addresses the concerns expressed in this comment.

AR-108 VII.B-34 (107) Why is oil-contaminated stormwater not subjected to aeration/flotation treatment?

The preparers considered only the treatment configuration proposed by the applicant. Aeration/flotation treatment of oil-contaminated stormwater is a mitigative measure which SCHEC could require. Such treatment of rapidly varying stormwater flows would require careful treatment process operation. As noted in an addition to page VII.B-36, stormwater allocations are now required for TSS, BOD<sub>5</sub>, oil and grease, pH, total phenols, total chromium and hexavalent chromium.

AR-109 VII.B-36 (108) The second paragraph speaks to a closed drainage system, but EPA is uncertain exactly what is being proposed. How can EPA, much less the public, evaluate impacts when there is this reoccurring uncertainty about the specifics of the project?

EPA expressed an obvious conclusion which explains how there could be oil-free and oil-contaminated stormwater. The uncertainty of precisely how oil would be removed from stormwater in the oil-contaminated area does not interfere with an evaluation of impacts if the estimated quantities of effluent and its components are provided, which they have been.

AR-110 VII.B-36 (109) We do not have the expertise currently to challenge the level of sophistication of the risk modeling related in subsection b. We are reminded of the great number of unknowns which have to reduce the accuracy of predictions of fates of spills. These include insufficient knowledge as to sediment types and transport mechanisms, hydrologic and meteorological information. See e.g. DEIS p.VII.B-92(b), where

The fleet composition serving the refinery is recognized as an important factor influencing the probability of oil spill accidents. Unfortunately, the very nature of oil refinery operations prevents vessel-specific data being used in the analysis. It is our understanding that, as is typically the case, the CUDC refinery will be served by chartered vessels, presently unknown. In order to proceed with an analysis, estimates were made of characteristics of the vessels likely to serve the refinery. These permitted the selection of accident data for the size of vessel serving the refinery. To insist upon specific data here is unrealistic. The oil spill probability analysis in the EIS incorporates findings from three independently conducted studies. These studies employed substantially different approaches to a subject area that is inherently understood. It is felt that "good science" permits a measure of confidence in the fact that these diverse approaches produce comparable estimates of oil spill risk.

The oil spill scenarios were reevaluated in the final EIS process and greater risk in the Sumpit River is now reflected in changes made to the text on page VII.B-49 (Case 1 and Case 4), page VII.B-53 (Case 6) and page VII. B-57 (Case 8) and to Figures VII.B-8 and VII.B-11.

A new oil spill scenario, Case 17, was added on page VII.B-70a; this case considers an oil spill resulting from a loss of tank farm storage, such as could be caused by a tank farm explosion in which multiple tanks were ruptured.

further study is recommended. Furthermore, even in instances where the information should be available, it is not given. Here reference could be made to discussion of the TRAM model on p.VII.B-38 where vessel-specific data is supposedly used to make the risk analysis of spills more site specific. Yet, we are never given that information relative to the vessels that will be supplying CRDC or transporting its finished products. Finally, there is the statement on p.VII.B-43 relative to the TRAM and Muga analysis: "Given that accurate measures of risk are not currently available..., the fact that these two independent analyses produce estimates that are so close indicates that they mutually support each other." Two questions: first, does that mean that they are correct; and second, is this good science?

In this review of spills and worst case scenarios, only case 5 (and case 2 to a slight extent) has a spill going up the Sampit. We believe the Sampit is at much greater risk. There is no examination of the potential impacts for fire and explosion at the refinery or at the associated tank farm. We believe that without remedying this, the DEIS is defective. As we stated in our 1981 Comments, refineries and tank farms do experience such catastrophies and CRDC could have (not counting hazardous wastes) crude oil, intermediates and products amounting to from 47,040,000 to 126,000,000 gallons.

AE-111

There is no discussion of a hazardous waste spill or catastrophe. 1981 Comments p.92.  
Please remedy these shortcomings.

AE-112 VII.B-49 (110) Is 112 barrels spilled in case 2 the total

§(11) amount of oil that would be contained in a submerged pipeline?

Was the situation considered where a pipeline leak occurred which was below the detection level of whatever sensing system is to be installed? Is there in fact any sensing system currently proposed?

AE-213 VII.B-54 (111) Did the analysis of a fire/explosion on a

§(12) tanker in case 6 consider the precedent of the explosion of the 70,000 dwt Samsunera? That ship was totally destroyed; but in this case only 30% of the total cargo was spilled?

F 101

AE-214 VII.B-54 (112) I do not find any discussion in case 6 of

§(13) terrestrial or nearby marine property damage or loss of human life or human injuries. Surely these considerations are necessary in the case of such an accident.

AE-215 VII.B-59 (113) Why is it not stated, even in the case of a total

loss of 140,000 barrels of crude oil (e.g. case 9), that respected experts believe large spills in low energy environments such as Kinjoh Bay may still be having residual impacts 100 years later? 1981 Comments p.90.

See the response to comment AE-38.

The applicant proposes 12 inch diameter pipelines across the Sumpit River. It is expected that 600 feet of river will be crossed, producing a volume in each pipe of about 84 barrels. Assuming that cutoff valves were located near the river crossing on both shores, the value of 112 barrels in the pipeline between valves is reasonable. Although the design of these pipelines is not completed, it is anticipated that pressure sensitive actuators would control automatic closure valves. A small leak in the pipelines could possibly exist which may not trigger the actuating device for valve closure. This small leak would in fact be a spill in the Sumpit River, but was not included as a scenario. The logic for scenario selection was detailed on page VII.B-43.

The analysis of Case 6 was based upon recommendations of the BROS Marine Safety Office as documented on page VII.B-53. A total loss scenario was included on Case 9.

A fire/explosion scenario such as Case 6 also could have been injury or death and possible damage to other nearby structures, depending upon the actual situation occurring. However this section of the EIS is basically a spill assessment; analysis of peripheral impacts from actions that caused the spill is not within this context.

The discussion for Case 9 mentions that oil will rapidly penetrate into the sediments in the nearby areas and tidal flats and "persist for years." Since adequate sediment transport models do not exist for Kinjoh Bay and precise knowledge of the physicochemical processes of oil and sediment interaction is lacking, such a general statement should be sufficient to enable an evaluation to be made of the potential impact that could be expected. See also the response to comment AE-47.

AR-116 VII.B-95

(114) Oil spills may endanger drinking water treatment plants below mile 16 on the Pee Dee and Waccamaw and Mile 13 on the Black River. The discussion should state whether there are any active or planned freshwater intake facilities in that range.

AR-117 VII.B-95

(115) There is no discussion as to how groundwater might be affected from major spills, fire or explosion at the refinery site, or from railroad or tanker truck use or from hazardous waste accumulation or removal. See 1981 Comments pp.49-53. This is needed.

VII.B-96

(116) It is remarkable that the Corps is giving consideration to permitting this refinery without CRDC having prepared an oil spill contingency plan. Thus, it is ironic to see that in the discussion of what a good plan should include, the BECO plan done to assist in preparing a DEIS for the Wilmington District is used.

AR-118

(117) It is important for the DEIS to note that prevention and containment plans do not address what is to be done about the absolute loss of natural resources.

Page VII.B-95 has been revised to state that no freshwater intakes exist within these stream reaches.

The impacts of oil on groundwater are discussed on pages VII.H-1 and 2, and would apply regardless of the cause of the spill. See also the response to comment AR-39 regarding hazardous wastes.

Since the purpose of prevention and containment plans is self evident, we do not believe it important to note what they do not cover. The potential loss of natural resources is covered in other appropriate parts of the EIS.



AR-119 VII.B-110 (118) It appears that the possibility of easy and comprehensive containment of spills is an illusion. Given three very optimistic assumptions, to wit, (a) immediate spill detection, (b) immediate reporting, and (c) deployment of crews and ample equipment within one hour, the process is ineffective or beyond the limits of personnel and equipment available in more than half of the scenarios proposed--and in almost all of the spills with major impact potential. Therefore, it should be clearly pointed out in any summary that, once more than a very small amount of oil or product is lost to the marine environment, we lack all but minor control over its fate and that of the receiving marine environment.

P-103

AR-120 VII.B-112 (119) As to operational impacts on water quality, the EPA states that some of CRDC's effluent constituents exceed federal limitations. EPA summarizes that while some impacts could be small (assuming the Sarnpit is the receiving body--there is no discussion of impacts if Pennyroyal or Turkey Creeks are used) some would be very large--e.g. ammonia discharges to the Sarnpit would be a 100% increase from current rates. Oil and grease additions "could create a large cumulative impact to the river, and subsequently bay sediments over time." Such conclusions are not insignificant and should be clearly pointed out in summaries such as those on page v.7 subsection 2.

The potential problems in controlling spilled oil are recognized in the EIS, but we do not agree with the conclusion at the end of this comment to the effect that there would be only minor control of any but very small spills. This conclusion appears to be unsubstantiated in view of the requirements of prevention and containment plans described on pages VI.C-7 and 8.

A statement has been added to page VII.B-113 addressing concerns expressed in this comment.

AR-121 VII.B-112- (120) Mention should be made here that certain of the  
113 effluent constituents being toxic, persistent,  
§c. bioaccumulative and carcinogenic. See Comment  
(103).

AR-122 VII.B-114 (121) See Comment (120).  
§e. From what was presented earlier relative to  
violation of USEPA limitations, it seems the  
summary must state that the refinery discharges,  
alone, will increase concentrations of certain  
constituents to unacceptable levels.

AR-123 VII.B-114 (122) Our copy of the DEIS had a repetition of a  
§4. portion of page VII.B-114 on page 115. Page 114  
did not discuss any unavoidable adverse water  
quality impacts from the operation of the  
refinery, such as NPDES discharge. If this is  
provided for on page 115, please provide; if not  
please see that it is discussed.

#### ENVIRONMENTAL CONSEQUENCES ON FISH AND WILDLIFE

VII.C-1 (123) The DEIS lists on page after page instance  
et seq. after instance of how an oil refinery and its  
persistent chronic and catastrophic losses of  
oil, intermediate and finished products and  
hazardous wastes conflict with the continuation  
of Winyah Bay as a nationally recognized estuary  
of great significance. The following language is  
especially relevant:

Trade-offs in land use represent the  
"big picture" with respect to refinery  
impacts on the Winyah Bay system. The  
current dominant uses of recreational  
and commercial fishing, wildlife conser-  
vation and scientific research cannot

A statement has been added to page VII.B-113 addressing this concern.

It is not likely that the refinery effluent alone would increase con-  
centrations of certain constituents to unacceptable levels. This may in  
fact be true within the vicinity of the outfall, but probably not for much  
more of the receiving water system. Most components, when diluted by the  
Savannah River, probably would be found in concentrations below those set  
for various freshwater, saltwater or human health standards. Components  
exhibiting higher concentrations are also discharged in large quantities  
by other industries in the Georgetown area. Hence, it cannot be stated  
that the refinery effluent alone would cause the increase. Cumulative  
effects would be of higher concern with respect to the discharge. With  
respect to USEPA limitations, see response to comment AI-6.

The refinery wastewater effluent, as presently proposed, will have  
impacts on the environment as has been discussed in this report. This  
impact is, however, not unavoidable. Technology presently exists to  
treat refinery wastewaters to the point where there could be little, if  
any, detrimental impact on the receiving stream. Once an NPDES limita-  
tion is imposed, it could be said that the impacts from the allowable  
discharge would then be unavoidable. However, an NPDES limitation for  
the refinery has not yet been established.

exist simultaneously with increases in polluting industry. The chronic pollution of upper Winyah Bay, especially the Sampit River, by existing local industry has already caused damage to this area (Allen et al., 1982). Studies of the Winyah Bay system indicate that although it continues to support populations of shrimp, crabs and fishes, the diversity and abundance of organisms are low, especially in the upper bay. The principle of diversity as it relates to ecosystem stability is well recognized. The implications of further stressing this already stressed system by lowering diversity through pollutant generation may affect the health and future of Winyah Bay as a functional estuary. There is no doubt that ramifications of lowering diversity at the ecological supporting pyramid of the estuary will manifest as direct losses of commercial and recreational fisheries. This coupled with the future inability to manage conservation areas for wildlife makes "the choices" for the future of the Georgetown area clear, distinct and critical.

DEIS pp.VII.C-49-50.

- AR-124 VII.C-9 (124) The local example of the oiling of over 2,000 migrating loons by a small offshore discharge in the Spring of 1981 would be a relevant inclusion.
- AR-125 VII.C-12 (125) The first sentence in third full paragraph should be lengthened as to dilution limiting mortalities associated with acute toxicity of the effluent. It should additionally state that this would not be as true (or true at all) if the effluent was discharged into Pennyroyal or Turkey Creeks.
- VII.C-12- (126) The discussions in the last paragraph on page 13 and the following 3 paragraphs on page 13 are very relevant to assessing the reasonableness of the Corps' statements as to minimal biological

This may be a relevant inclusion, however, the discussion in the EIS of the effects of oil pollution on birds is sufficient, so we do not believe the inclusion of the cited example would add enough to the discussion to warrant revising that part of the EIS.

This information has been added to Page VII.C-13.

impact set out at page V.7 subsection 2.

AR-126 VII.C-19 (127) A topic of great interest which is not addressed and should be is the human health implications of eating fish and shellfish which have suffered sublethal contamination due to refinery effluents.

The toxic constituents of refinery effluent would be too dilute for human consumption of fish and shellfish to have any human health implication.

AR-127 VII.C-43 (128) The refinery will cause negative impacts on at least five species listed under the federal

Endangered Species Act, 16 U.S.C. §1531 et seq. (1982). Following the requirements of the

statute, the Corps held \$7 consultations, 16 U.S.C. §1536 (1982), with the Fish and Wildlife Service and the National Marine Fisheries

Service, in part to determine if the agency in permitting the refinery could comply with the statutory mandate in §7(a)(2) that it "insure that any action authorized...by it is not likely to jeopardize the continued existence of any endangered species. 16 U.S.C. §1536(a)(2) (1982).

A biological opinion was issued by NMFS on July 8, 1982, and portions of the letter summarizing its conclusions and transmitting it to the Charleston District are quoted on DEIS p. VII.C-47, 48. Because of some confusion, NMFS followed that opinion and letter with a supplemental letter which noted in part: "In view of the above, it is our opinion that the operation of the proposed CRDC refinery is likely to jeopardize the continued existence of the southern population of shortnose sturgeon."

See the response to comment NF-2 regarding the Endangered Species Act.

Letter from William G. Gordon, Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration, Washington, D.C., to Colonel Bernard E. Stalman, Charleston District Engineer, October 13, 1982

As noted earlier, the Corps has apparently chosen to ignore this jeopardy opinion. For example, it has made no mention of it in Table V.1 where it gives its scaled-down version of refinery impacts. At the public hearing on the DEIS, Colonel Smith stated that CRDC "would not affect endangered species by its operations."

While the Corps may still issue a permit in the face of a jeopardy opinion, it must do so only after a thorough review and a decision that it can insure the continued existence of the endangered species. An agency that proceeds with an action in the face of inadequate knowledge or information does so at the risk that it has not satisfied the standards of §7(a)(2). As the Supreme Court stated in TVA v. Hill, 437 U.S. 153, 188 n.34 (1978), an agency must use all efforts likely "...to prevent the loss of any endangered species, regardless of the cost."

The DEIS does not present any justification for the Corps' apparent rejection of the biological opinion. That is, there is no well considered decision, based upon the best scientific and commercial data available, finding that the NMFS is wrong.

Unless there is a wealth of information that the Corps has developed and inadvertently failed to include, the permit must be denied or the Corps will be in violation of the Endangered Species Act. See Roosevelt Campobello Intern'l Park Comm'n. v. EPA, 17 E.R.C. 2023 (1st Cir. 1982).

VII.C-57 (129) Based upon the biological opinion rendered by §b.1. the NMFS, there should be added to this list of impacts which will definitely occur: "The inability to insure against the likely jeopardizing of the continued existence of the southern population of the endangered shortnose sturgeon."

VII.C-58 (130) Subsection 8 as submitted by F&WS should be placed in full on the bottom of this page. See Comment (20).

#### SOCIO-ECONOMICS

VII.D-1 (131) What will be the impact on groundwater reserves in the area from the use of great amounts of such water by CRDC.

VII.D-1 (132) A major oil spill would have a direct impact on tourism both in Georgetown and, as the French without oiled beaches discovered after the Amoco Cadiz, on uncoiled areas north of Georgetown. This should be recognized.

VII.D-1 (133) As noted in Comment (48), there are estimates for the costs of upgrading roads.

VII.D-2 (134) The total number of people employed based upon surveys of similar refineries is just as likely to be 60. 1981 Comments, Appendix C. p.5.

See the response to comment AR-29.

The impact depends on which aquifer is used, being much greater for a shallow aquifer than for a deeper aquifer. Page VI.J-3 has been revised to show that a Groundwater-use permit must be obtained from the S.C. Water Resources Commission, and the impact of groundwater withdrawal is addressed in an addition to page VII.H-2.

In view of the location of most of the tourist industry north of Minyah Bay and Georgetown and the improbability of a major oil spill, we do not believe the suggested revision is warranted. With reference to the implied severity of the Amoco Cadiz incident, Willard Bascom notes on page 69 in the June 1984 Issue of Sea Technology that "The Amoco Cadiz spill did severely affect the oyster and tourist industries in Brittany for one season (study costs were a large fraction of the losses)...."

The EIS states that the increase in traffic on S.C. 42 attributed to the refinery would increase maintenance costs. However, it has not been determined to what extent this road would have to be upgraded and what portion of the maintenance costs could be attributed to the refinery.

The source of the data on the number of employees and their average wage is the study by Davis & Floyd, Inc. and Arthur D. Little, Inc. which is cited on page VII.D-2.

VII.D-2 (135) What is the authority for a \$28,000 average direct wage in an oil refinery? Figures developed by our expert economist show a range from under \$10,000 to 22,000/year exclusive of executive management personnel (who incidentally are unlikely to be local hires). 1981 Comments, Appendix C. p.8.

VII.D-2 (136) Employment dollar benefits would only be valid if it were shown that the plant is necessary and has at least a good chance of succeeding and remaining in business. The same is true for any tax. This has not been done. See Comments (4), (15).

VII.E-1 (137) Please give authority for operational noise levels of 50-55 decibels, and "below 50 decibels at the refinery property limits."

VII.G-1 (138) See Comment (52) and 1981 Comments pp. 57-59 as to the potential importance of this area archeologically and as to the process which must be followed to assure that artifacts of historic value are not destroyed or displaced.

VII.H-1-2 (139) This discussion does very little to give information as to specific nature of oil impacts on groundwater. It does not identify recharge areas, or deep or shallow, public or private wells which could be affected. It needs to be rewritten after the information noted as being required in the last paragraph is obtained. See Comment (115) and 1981 Comments pp. 49-53.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications.

The authority for noise levels is: Secrets of Noise Control, A. Thuman and R.K. Miller, 1974. The Fairmont Press.

See the response to comment AD-1 regarding the lack of impact to cultural resources.

Many of the factors that can make an oil spill on water very difficult to control and clean up are not applicable to land spills. Such spills are not susceptible to spread by tides and wind and various kinds of equipment can be readily brought into operation to control the spread of oil and clean up all spilled oil in a relatively short time. Because of the relative ease with which spilled oil can be retrieved plus the great improbability of a large spill ever occurring, we do not believe that additional discussion of the impact of oil on ground water resources is warranted. This information has been added to Page VII.M-2.

CONCLUSION

For the reasons set out above and in the 1981 Comments attached hereto, we maintain that the Corps must deny the application of Carolina Refining and Distributing Company for a Section 10 Rivers and Harbors Act permit because it would not be in the public interest.

Respectfully submitted,

Buist, Moore, Smythe & McGee

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28 May 1984



Post Office Box 8  
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May 25, 1984

Mr. John L. Carothers  
U. S. Army Corps of Engineers  
Charleston District  
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Dear Mr. Carothers,

On Monday evening, May 21, the Santee Preservation Society met in McClellanville to review the Draft EIS for an oil refinery in Georgetown prepared by the U. S. Army Corps of Engineers. The Santee Preservation Society is a ten-year-old organization made up of people concerned about the physical and cultural heritage of the Santee coastal region, including the Santee Delta and the lower Santee River system, Cape Romain National Wildlife Refuge, and the Francis Marion National Forest. We monitor proposed changes in land-use and water-use, and we meet periodically to discuss developments which affect our region.

The Society appreciates the effort and care that have gone into researching and compiling the Draft EIS. We believe, however, that several topics ought to be addressed more fully in the final document.

First, who is the Carolina Refining and Distributing Company? What experience does the company have in refining oil? Where has the company operated before and where is it currently operating? What is its environmental record? Why were its proposals to build refineries rejected by two North Carolina cities, and what makes the Georgetown proposal more acceptable than those? Apparently, the company does not own, or even have an option to buy, the land it plans to build on. That agreements does it have?

Second, while the Draft EIS indicates the number of jobs the refinery would sustain operating at full capacity, it does not take into account the extent of capacity at which comparable refineries are actually operating. Nor does it consider the impact on jobs of fluctuating demand for petroleum products and of competition from larger refineries. Any discussion of jobs likely to be created by the refinery should be balanced by a projection of the number of jobs threatened by the refinery; threatened, that is, by the degradation of Winyah Bay and adjacent bodies of water and wetlands. How many jobs in research, conservation, and education, as well as fishing

Questions about the background of the applicant are beyond the scope of this EIS and the responsibility of the Corps of Engineers. The responsibility of the Corps of Engineers is to determine whether or not it is in the public interest to grant a permit for an underwater pipeline which would become part of the operation of a new oil refinery. As an information gathering document, the EIS examines impacts of this project and its alternatives.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. Although it can not be determined precisely how the aquatic environment would be affected by any specific increment of pollutants, the increment to be contributed by the refinery would be relatively small. Also, the compliance of the refinery with the conditions of its air and water quality permits from DHEC should preclude unacceptable impacts and the subsequent loss of jobs. See pages VI.C-4 and 5 for a discussion of requirements DHEC can establish for monitoring and compliance with the NPDES permit which should insure compliance with all standards.

and seafood processing stand to be lost as a result of both "definite" and "probable" impacts?

Third, the comparability of an oil refinery in Georgetown with the Cape Romain National Wildlife Refuge and the Santee River Delta has not been adequately explored by the Draft EIS. This is the single major failing of the study, in our opinion. Though it may be seventeen miles from the site of the refinery, Cape Romain begins only ten miles from the entrance to Winyah Bay; North Santee Bay, but five miles. Winyah Bay is treated in the study as if it were an enclosed body of water, a lake. It is not, of course. Winyah Bay flushes its pollutants directly into Cape Romain. Whatever drops into the water at the Georgetown Jetty rolls up on the shores of Casino Creek. No survey of the ecology of Cape Romain can ignore Winyah Bay; conversely, no study of Winyah Bay should overlook its profound effects on Cape Romain. Of the sixteen "worst case" spill scenarios described in section VII-B of the Draft EIS, only one of them, case 15, is shown to significantly harm the Cape. Our analysis of the scenarios sharply disagrees. We believe that cases 7, 10, 11, and 16 would probably affect the Cape, and that cases 1, 2, 13, and 14, in addition to case 15, would definitely affect the Cape--that is, they would destroy an "undisturbed" seashore and kill off one of the richest aquatic nurseries in the country. Measures to mitigate the calamity by reducing the quantity of oil that washed over the Cape would be irrelevant.

There are certain realities so overwhelming as to admit of only one interpretation, and the case presented by the Draft EIS is one of them. To build an oil refinery in the unique, extremely sensitive Winyah Bay estuary would be a crime against the people of South Carolina. Its consequences would be so grave as to eclipse any conceivable gains. The Draft EIS leaves us with the results of day-to-day operations, let alone catastrophic spills--reduction of marsh productivity in and around Winyah Bay, loss of aquatic nursery functions in the estuary, lethal and sublethal effects on birds, crabs, and fish--would strike a blow at the livelihood of hundreds of people and the viability of entire communities. No one should be allowed to inflict this damage. The application to permit oil pipelines across the Santee River should be denied. We urge the Corps to follow up its excellent investigation with the only decision justified by the evidence.

Very truly yours,

*Theodore Rosenbarten*  
Theodore Rosenbarten

Secretary  
Santee Preservation Society

It is generally agreed that adequate hydraulic flushing models are not available for Winyah Bay. Therefore it cannot be determined accurately for any scenario how much of the oil spill will be flushed out of the bay and then impact on Cape Romain or the Santee River Delta. Cases 6, 9, 13 and 14 might present opportunities for oil to impact Cape Romain, provided a reasonable portion was able to flush out of the bay. Cases 13 and 14 would be more likely to create an impact, although the scenario has the wind pushing the slick to the north. These scenarios, of course, represent only a few of the myriad of possible scenarios. A spill such as Case 13 or 14 with different winds could indeed be expected to create a large landing of oil on the Cape Romain area, as would a total loss near the bay entrance with north winds and ebbing tide. It is felt that Cases 7 and 8 as presented probably would not cause an impact to the Cape Romain area due to the smaller size of spill and high potential for dispersion and stranding prior to flushing, from the bay. Case 10 has potential to create some type of impact on this wildlife refuge. Cases 11 and 16 could create impacts if conditions changed somewhat from the initial scenarios or with time following the events. Since the entire life of the spill cannot be modeled yet and since all possible spill scenarios are too numerous to be addressed in the DEIS, an attempt was made to evaluate a representative number of different scenarios.

Comments noted.

# YAWKEY FOUNDATION

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May 25, 1984

JEAN R. YAWKEY  
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TRUSTEES

Mr. John L. Carothers  
U. S. Army Corps. of Engineers  
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Dear Mr. Carothers:

For most of this century, the Yawkey family has taken great pride in preserving thousands of acres of sensitive coastal property in Georgetown County. Mr. Tom Yawkey spent his childhood on South Island and over the years it became his true home, as he spent the major part of his time on the Island. During those years, Tom Yawkey invested millions of dollars in constructing roadways, dike systems, waterfowl impoundments and feeding areas, in order to enhance the natural attributes of the property as a waterfowl refuge and wildlife preservation.

Comments noted.

In 1976, all of Tom Yawkey's property on Winyah Bay was willed to the State of South Carolina and is now known as the Tom Yawkey Wildlife Center. The Wildlife Center embraces North, South and most of Cat Island; three coastal islands composed of 20,000 acres of marsh, impoundments, forest openings, ocean beach, pineland and maritime forest. Tom Yawkey's bequest is considered one of the most outstanding gifts to wildlife conservation in North America. He dedicated the property principally to the management of waterfowl habitat for the purpose of wintering large numbers and varieties of waterfowl. And, to insure that his intentions would be fulfilled, Tom Yawkey established a significant endowment fund to support the future maintenance and preservation of the Wildlife Center, which has earned the reputation over the years as one of the most outstanding waterfowl refuges on The Atlantic Flyway. At the present time, approximately \$500,000. per year is expended from the fund to carry out the preservation, research and educational activities at the center; virtually all of which is channeled into the economy of Georgetown County through salaries and the purchase of goods and service.

Tom's gift to the public domain, of property rich in natural and wildlife resources, is a significant challenge to all parties charged with fulfilling the terms of this bequest, which parties include not only the Foundation Trustees, but all those county, state and federal officials who exercise authority over the use and preservation of properties in the Winyah Bay area. The Corps of Engineers has the principal control of all the waterways surrounding the Wildlife Center and has a clear obligation to honor the Trust which Tom Yawkey placed in the Corps by leaving the property in our care for posterity.

The Draft Environmental Impact Statement for an oil refinery at Harmony Plantation and Myrtle Grove clearly shows that significant adverse impacts will definitely occur within the Winyah Bay area. Such impacts, as reported by the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency and the U.S. Geological Survey, should be sufficient to conclude that the operation of a refinery in the subject locations pose an inordinate risk in comparison to the only favorable impact reported, i.e. a boost to the local economy.

May 25, 1984

A-2

In addition to the definite damage resulting from the chronic and consistent pollution of the air and water resources, the draft report indicates a certain potential for oil spills which would cause extensive, long-term and possible irreparable damage to the unique surroundings of Winyah Bay. The conclusion by the Corps. of Engineers that "large oil spills are very unlikely", is an invalid conclusion because of the deficient methodology and outdated, inadequate and inapplicable data used in the three statistical analysis of the probability of the occurrence of an oil spill. The details of the report clearly point out such defects, and the details even contradict the conclusion by stating that "...accurate measures of risk are not currently available..." and "...the only statistics that can be stated with any confidence is the maximum spill volume of 140,000 barrels...". I fail to see how the Corps. of Engineers can reach any conclusion as to the probability of a spill based on the present data in the draft report, and especially since the draft report acknowledges that an independent analysis of oil spill probabilities was not performed. A conclusion on the probability of oil spills cannot be reached until an independently sponsored analysis is performed. This analysis must be based on the "site specific" environmental and geographic factors; and more importantly, based on the specifics of the tanker fleet composition, since such is the single most important factor influencing the outcome of an oil risk analysis. Under existing circumstances, the conjecture on the likelihood of an oil spill cannot be used by anyone to permit the construction and operation of an oil refinery in the Winyah Bay area.

The oil spill probability analysis in the EIS provides a rational basis upon which the decision-making process can continue. It is recognized that there are imperfections in the data and methods used in the analysis. Even where deficiencies are recognized in the data or methodology employed, the modeling process may continue to produce meaningful results. To quote from the EIS, "because it is based on historical data, the analysis is inherently conservative because these data do not reflect the influence of technological improvements on ship design, terminal design or navigational aids. Also, the influence of more rigid regulations, training and safety standards is not reflected." Therefore, it is not felt that the decision-making process need be delayed on account of this issue.

The point has been raised that the EIS analysis is not site specific. Site-specific data were included where available and appropriate. Modeling of complex mechanisms may require a choice as to which data are appropriately included. Such decisions are made in order that the model results are free of bias, or, where bias is unavoidable, that it err on the side of conservatism. To illustrate this point consider the decision to utilize worldwide accident data. Had only data for Winyah Bay been used in the analysis, making it truly site specific, it would be tempting to conclude that the accident-free record indicates a zero probability of an oil spill with future traffic. But, as Muga points out, "the historical record represents a small data base and therefore is of questionable reliability" and "therefore, we must utilize a larger data base."

Other site-specific factors include the environment and geography of Winyah Bay. Again, such factors have been considered. For example, the TRAM model permits distinction between five categories of spill location. Applying TRAM to Winyah Bay, only accidents occurring in the mouth or confines of a harbor, bay etc. were considered from the global data available to make the analysis site specific. A more specific selection of data would recognize that the geography of Winyah Bay includes a soft, muddy bottom. While such a factor could not be quantitatively incorporated into the model, it was pointed out that the analysis would tend to be conservative. The historical record for Winyah Bay includes groundings but in no instance did these lead to oil spills. The choice of data here is likely to produce more severe probabilities of spills than would be the case if the data had been screened for channel bed characteristics.

The fleet composition serving the refinery is recognized as an important factor influencing the probability of oil spill accidents. Unfortunately, the very nature of oil refinery operations prevents vessel-specific data being used in the analysis. It is our understanding that, as is typically the case, the CRDC refinery will be served by chartered vessels, presently unknown. In order to proceed with an analysis, estimates were made of characteristics of the vessels likely to serve the refinery. These permitted the selection of accident data for the size of vessel serving the refinery.

A-3

The issues on the permit application boil down to one of several alternatives. Can the economy of Georgetown County be enlarged by new commercial operations with less adverse impact on the air? Can the applicant for the permit find a location for the refinery which would produce less adverse impacts on that location? Neither of these questions are adequately addressed in the draft report, leaving one with the clear notion that better alternatives are available. More specifically, the manner in which the consideration of the Charleston site was terminated, is indicative that a different set of standards is being used to evaluate various sites. The Charleston site, the report stated, had "no air quality problems", however, consideration of the site was terminated because sulphur dioxide off-gases were not available. Yet, the report stated that operation of a refinery in the Winyah Bay area would "further degrade air and water quality and aquatic resources in an area stressed to an undetermined extent by existing pollution". It is highly questionable then why the Charleston site, with no air quality problem, was given such little consideration when the Winyah Bay site was considered extensively, in light of admitted existing air and water pollution problems.

With regard to the first question in this comment, there are many unrelated types of industries which would have less effect on air quality, but this is not relevant to the scope of this EIS which deals only with the proposed oil refinery and alternative means of satisfying the applicant's needs and the public's need for energy.

With regard to the consideration of the Charleston site, its unsuitability is described on page V.1. The Charleston site was terminated from further consideration because the area's available allowable sulfur dioxide increment has been essentially consumed and off-gases could not be obtained. What this means is the area's existing industries that have been permitted either could not or were unwilling to give up their allowable emissions to new industry. The phrase "....there were no air quality problems in this area..." refers to the existing air quality of the area.

There is sufficient available increment of sulfur dioxide at Georgetown to accommodate the emissions of the proposed refinery. See the evaluations that DREC made before issuing the PSD permit on pages VII.A-11 and 12 which enabled it to predict that the National Ambient Air Quality Standards would not be violated.

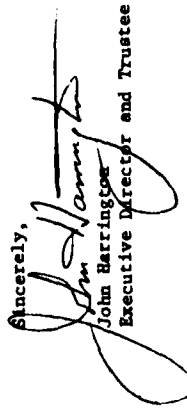
A-4

Furthermore, the report does not deal with other possible sites because the "applicant was unable to identify satisfactory market conditions outside of Charleston and Georgetown". Well, one has to wonder why an agency of the U. S. Government would rest its case on the inability of the applicant to identify market conditions to his satisfaction especially when the burden of proof is on the applicant to provide such data. Just what were the market conditions in the area they studied? How many areas did they research? What has happened to the Savannah site and to what extent was it considered by the applicant?

The word "satisfactory" was intended to indicate those market conditions that would be most likely to enable the applicant to make a profit. See the response to comment A-1 regarding the Corps' evaluation of the economic aspects of permit applications. The applicant's major requirements for market conditions and potential sites found in the Charleston District are discussed on page V.1. The Savannah site is not an alternative to the Georgetown site as shown in the discussion on page V.2.

A-5

In closing, I find the report clearly demonstrates that there are definite, significant, adverse impacts, with potential devastating adverse impacts resulting from the operation of a refinery in the Winyah Bay area. To try to mitigate or minimize these impacts by means of speculation and conjecture is a violation, not only of the trust which Tom Yawkey placed on the public sector, but of the public trust placed on each public official, all for the benefit of a private entrepreneur, with other alternatives available for his ventures. The denial of the permit is the appropriate recommendation of your final study for the Environmental Impact Statement.

Sincerely,  
  
 John Harrington  
 Executive Director and Trustee

/pb

Comments noted.



## The South Carolina Wildlife Federation

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May 24, 1984

Dear Mr. Carothers:

The South Carolina Wildlife Federation presented some comments on the Draft Environmental Impact Statement (DEIS) on the Georgetown Refinery at the April 26, 1984 public hearing in Georgetown and wishes to add these comments to the ones already submitted.

The Environmental Impact Statement was written to generate information not provided in the two Environmental Assessments, to provide a full and fair discussion of significant environmental impacts and to inform the public and decision makers of reasonable alternatives. In discussing the environmental consequences, the document should provide a scientific and analytical basis for comparison of the relationship between short term use of man's environment and the maintenance and enhancement of long term productivity and any irreversible or irretrievable commitments of resources. For the first time, information has been prepared and analyzed by resource professionals on the actual impact of the refinery and its operation on the long term productivity of the Sappit River and Winyah Bay.

TABLE V-1: We have commented on the irresponsible conclusion drawn by the Corps of Engineers on page V-7 concerning the significance of impacts found by cooperating agencies. Table V-1 on page V-8 is misleading, prejudicial, and not reflective of the findings of the document. The table should either be redone to represent the facts and findings or omitted entirely. It is interesting to note the gratuitous comment under "permit denial" (Column 2) which says "but future base conditions may change significantly due to other developments." The comment is not pertinent; it should not be included. If, however, it is included, the same clause applies to socio-economic considerations. The impacts, it should be noted, could be either positive or negative depending on what the "other developments" are.

The table findings in column 3 on water, wildlife, fishery, endangered species, and groundwater are not those of the DEIS. Impacts outlined in the DEIS are hardly minor. Since the DEIS is directed at refinery operation in its broad scope, the long term results would be the same no matter where the pipeline is located. This means that

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table. Column 2 of Table V.1 has been revised to show the same impact in the socio-economic area as in other areas. Columns 7 - 10 apply specifically to pipeline routes and are correct in that sense. See also the response to comment AL-2 regarding the Corps' requirement for information from permit applicants.

AN AFFILIATE OF  
NATIONAL WILDLIFE FEDERATION

columns 7-10 are not correct either. In comparing alternate locations, the negative impacts on Winyah Bay will be much greater due to the quality and uses that occur on the Bay than, for instance, in Charleston Harbor. The chart and discussion of alternatives do not reflect this.

It is impossible to evaluate column 14 on issuance of a conditional permit without specific information. Much of the information on specific refinery design and operation is lacking. It is our belief that conditions should not be based on information yet to be prepared, but that all such information should be prepared for evaluation in the actual EIS.

Economic benefits: The discussion of economic benefits is brief and altogether inadequate. The degree to which the refinery would enlarge the economic base of Georgetown County is not demonstrated. Although the removal from the tax base of land now used by the Baruch Institute and the Wildlife and Marine Resources Department is mentioned as a negative factor for Georgetown, the addition and/or value of employment and/or research at these areas is not noted, but should be. It is very possible, too, that the actual placement of the land in the public domain could have increased surrounding property values and offset some of the revenues foregone. Certainly economic benefits from the refinery should be weighed against current value of the resources and related employment which are present and which could be negatively affected by chronic presence of hydrocarbons and other toxics as well as oil spills. Economically productive areas, such as fisheries, current research, and tourism would be hurt by oil spills.

The employment figure should be clarified concerning the type of employment to be available and the related salary levels. What kind of skills are needed? Is the labor force with the needed skills available now in the Georgetown area? The average salary level of \$28,000 seems high for laborers, but no figures are given for how many of the employees are management, how many are technicians, how many are laborers, or the respective salary ranges so it is impossible to evaluate the substance of the claim.

Endangered Species: Winyah Bay is utilized by a number of endangered species. Table V-1 and point 8 on page VI D-36 say that no critical habitat for endangered species has been identified in the area. This statement can easily be misleading. The term "critical habitat" should be defined. As we understand it, "critical habitat" is a legal term that denotes official designation in an approved recovery plan. We also understand that several plans are under consideration in which areas in the Winyah Bay region are nominated for critical habitat designation. This clarification and point should be made in the EIS.

Even without "critical habitat" designation, the Bay area is used by endangered species. Almost all oil spill scenarios listed would impact these species, and the DEIS finds that the persistence and presence of hydrocarbons and toxics in the sediment will have a detrimental long-term effect.

Eagles utilize Winyah Bay some six months of the year. Therefore the eagle should be included in Tables VII C3-C5 on pages VII C25 - VII C30.

Consideration should be made of possible contamination of the Kemp's Ridley turtle. This species has been recorded in the Winyah Bay system, and the species is on the brink of extinction and cannot sustain losses.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. The economic benefits of the Baruch Institute are discussed on page VI.K-1 and the economic benefits of the Yawkey Wildlife Center have been added to page VI.K-2. The impact of the refinery on the economic value of fish and wildlife resources has been added to page VII.D-2. The source of the data on the number of employees and their average wage is the study by Davis & Floyd Engineers, Inc. and Arthur D. Little, Inc. which is cited on page VII.D-2. In view of the numbers of skilled workers laid off at International Paper Company and Georgetown Steel, there are probably enough skilled workers available to meet the refinery's needs. We do not believe that more detail on employment is practical to develop now in view of the status of the refinery and its design.

Page VI.D-36 has been revised to note the consideration of critical designation in Winyah Bay. Critical habitat has also been defined.

Tables VII.C-3 and VII.C-5 have been modified to include eagle nesting periods.

A11-1

The National Marine Fisheries Service (NMFS) has found that the proposed refinery "is likely to jeopardize the continued existence of the southern population of shortnose sturgeon." Information presented in the NMFS Biological Opinion was accurate and very up-to-date. This information and opinion should be included in its entirety in the EIS. NMFS points include the fact that the shortnose sturgeon are not known to move between river systems, so loss of habitat could very well mean critical loss of a given population. The population would not transfer to another location.

NMFS also points out that the status of shortnose sturgeon in Winyah Bay is poorly understood, but, based on records, sturgeon use the Bay year round. Winyah Bay may provide the most important "refuge" for shortnose sturgeon in its southern distribution area. The Bay is especially favorable to sturgeon because of the availability of deep water, food, and relatively unaltered estuarine and associated riverine habitat. NMFS found adverse impacts on species are likely with spills or chronic presence of hydrocarbon because of the long life span of the species, the fact that it is a bottom dweller and benthic feeder and the fact that sturgeon reproduction may occur in Winyah Bay.

Arguments previously offered by the Corps to address the Biological Opinion are not substantiated by the data or other documentation and should be disallowed.

A11-2

Oil spills: Conversations with Dennis Allen of the Baruch Institute indicates that the description given in VI C-27 on the protection afforded North Inlet from Winyah Bay water by the nodal point at Jones Creek is not accurate. Water exchange does take place on a regular basis due to the volume of sheet flow across this point. Since North Inlet has such value for its Long Term Ecological Research and would be extremely vulnerable if contamination occurred, the description of water exchange must be accurate in the final EIS.

A11-3

The authors of TRAM point out that the fleet composition is important in the oil spill risk analysis, but we do not know what this fleet composition will be. This information is needed.

The NMFS biological opinion is attached to the NOAA letter of comment. See the response to comment AF-2 regarding endangered species.

Effects of both sheet flow and conditions under which the nodal point in Jones Creek can be overridden have been clarified in the EIS text on page VI.C-27.

The fleet serving the refinery would consist of charter vessels limited in size by harbor channel dimensions to about 20 to 25,000 dwt. No commitments for shipping have been made; however, all ships would have to comply with Coast Guard regulations which are addressed on pages VI.C-7 and 8.



Will barge traffic increase significantly due to the refinery? Since there is not a restriction on the number of oil barges traversing Winyah Bay, would the risk of collision and/or spill be increased? (page VII B-41) The actual transport of refined product from the refinery is vague.

According to current plans, 20,000 ton tankers, rather than barges, would be used to supply the refinery with crude oil. Thus no increase in barge traffic would be expected unless barges are used to ship refined products. The applicant has indicated that the majority of the product would be distributed by tanker truck; nevertheless the option to use barges to ship refined product is inherent in the applicant's plans for the pipeline crossing of the Sampit River, and has been considered in six of the hypothetical oil spill scenarios in the draft EIS. Any consideration of potential increase in the risk of collision and oil spills, however, should include all petroleum transport vessels. Current petroleum shipments through Winyah Bay and the Intracoastal Waterway include annual averages of five tankers of 89,100 barrel capacity, 23 barges of 17,117 barrel capacity, and 41 barges of 10,500 barrel capacity<sup>1</sup>. Considering only the projected shipments of crude oil to the proposed refinery (78 tankers per year of 140,000 barrel capacity), increases of 113 percent in total petroleum transport vessel traffic and 860 percent in total petroleum cargo in Winyah Bay can be expected as a direct consequence of permitting the refinery.

#### Footnote

1. These estimates are based upon actual petroleum shipments to the Hess terminal at Georgetown from July 1983 through March 1984 (personal communication, Bill Lightsey, South Carolina State Ports Authority, Georgetown, SC, 22 May 1984), and average shipments of JP-4 fuel oil to the Myrtle Beach Air Force Base (personal communications, Lt. Joe Davis, MAFB, and Mr. Simmons, Myrtle Beach Pipeline Company, 22 May 1984). The number of shipments to the Hess terminal may be reduced if the International Paper Company, its primary client, reduces its dependency upon oil as is anticipated.

It is difficult for the layman to determine what percentage of crude oil is made up of water soluble fractions. Since these are the most dangerous to aquatic life of those components which can enter the water column (VII B-95), this information should be identifiable.

It is important to note that, given sufficient time and tidal cycles, oil will span the breadth of Winyah Bay (VII B-44). It is also important to note that percentage of oil which can be cleaned up is estimated to result in only 20-50% recovery of material moving into the contained/cleanup area (VII B-106). This is very discouraging. It is also discouraging that the feasibility of responding well to an oil spill is very limited and variable. Almost all normal, expected factors could easily work to the detriment of an effective response. (VII B-101)

For spills at the site, the EIS seems to rely upon the S.C. Department of Health and Environmental Control for assuring the existence, quality and implementability of the Spill Prevention Control and Countermeasure Plan (SPCC). Conversations with HREC indicate that it does not have the manpower to carry out this program now, and that inspections are just as the EIS indicates -- random (VII B-96). This is no assurance at all.

The identification of the water soluble fraction of crude oils is difficult. Generally the polar molecules have higher solubilities, such as the aromatics, and the non-polar molecules are more insoluble, such as the paraffins. Some portions of the asphaltenes in the residual portion also may be highly soluble. However, unless adequate mixing occurs, even the "soluble" portions may not go into solution or may go in very slowly. Based upon these considerations, fifty percent or more of the spilled crude could be soluble. However, in reality, less than 15 percent of the spill volume may dissolve (Butler et al., 1976).

AIU-9

Runoff at the site can also create a problem. Refined oil could be more toxic than crude. Although the DEIS says spills can be controlled, it goes on to say that for runoff treatment, sizing of facilities is an important consideration (VII B-10). However, this information is not known. It should be required information to be incorporated in the final EIS.

Miscellaneous comments:

AIU-10

The applicant has given the impression that the refinery's water would be purchased through the municipal system. As a matter of fact, the Georgetown Times reported July 24, 1980 that the Georgetown City Council voted in favor of the refinery in part because of the revenues to be generated by serving the facility. Now, apparently, the refinery will use ground water (VII D-1). Not only does this mean a reduction in "economic benefits" for Georgetown, but it also will require additional environmental considerations and permitting since the site is within a designated Critical Area. The final EIS must take this into consideration and address this point.

AIU-11

It would be helpful if the word "conservative" were defined. The reader cannot determine if the conservative figure is greater than expected or less than expected.

AIU-12

Information should be included in the final EIS which is presented in the recently completed study Pollution of Winyah Bay, S.C.: Characterization of the Estuary and Potential Impacts of Petroleum, D.H. Allen, W.K. Michener, and S.E. Stancyk, Eds., Baruch Institute Special Publication No. 84-1.

In summary, the information presented in the DEIS confirms the potential for irreparable damage, not just from oil spills, but from normal operation of the refinery. It has not been demonstrated that these negative impacts can or will be mitigated. It has been demonstrated that the impacts can be expected. For this reason, the permit should be denied.

B-120

kindest regards,

*Betty Spence*

Betty Spence  
Executive Director

BSS/

A detailed design has not been prepared for the proposed facility. As stated on page VII.B-10, spill prevention and runoff treatment measures will be incorporated into the refinery design. See also the response to comment AI-2 regarding the Corps' requirement for information from permit applicants.

See the response to comment AI-3 regarding the source of process water for the refinery.

A conservative substance as used on pages VII.B-28 and VII.B-30 has been defined in the text as one that is dissolved and non-degradable.

The EPA and the FWS consulted the Baruch Institute during the preparation of the EIS and the data and information provided are reflected in the DEIS.

JOHN R. CLARK

Water Resources Analysis Ecosystem Conservation

Hickory Landing

P.O. Box 246  
Hollywood, Maryland 20636  
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May 25, 1984

District Engineer  
U.S. Army Engineer District, Charleston  
ATTN: SACIN-2  
P.O. Box 919  
Charleston, South Carolina 29402

Dear Sir:

I am writing to comment on the Draft EIS on "Oil Refinery, Georgetown, S.C." on behalf of my clients, including the Yankee Foundation, donor of the largest property on Winyah Bay and financial supporters of the state-operated Yankee Wildlife Research Center.

The purpose of writing is to request essential additions to the Draft EIS in order to bring it up to standards and make it acceptable for government decision purposes, for administrative reviews up the line, and by other agencies, and for judicial review should the matter come before the courts.

Certain of the additions and modifications herein requested appear below and others are contained in Attachment 1.

- 1) Provide a detailed analysis of public need for the refinery in the FIB.

The EIS contains no support for the statements that the public need for the refinery "...lies primarily in the ready supply of refined products in the region" (p. IV.1) and "...is represented by the demand for refined petroleum products." (p. II.1). It is not enough that a business opportunity is recognized. There must be a full and detailed analysis and verification of need and benefit to the broad public which balances all the disbenefits with all the benefits. Section VI.7 does not provide the needed information or analysis.

- 2) Provide a detailed analysis of all losses as well as gains from the project and present a net benefit/loss assessment in the FIB.

The EIS presents no basis for balancing economic (and social) gains and losses and is therefore grossly inadequate and provides no basis for making and reviewing a decision about the refinery permit application. For example, major economic benefits listed

The need for the refinery is addressed to the extent required by Corps of Engineer policy contained in 33 CFR 230 App. B § 11(b)(4).

See the response to comment A1-1 regarding the Corps' evaluation of the economic aspects of permit applications.

B-121

A7-1

A7-2

are that the refinery would "...have a positive impact on the tax base..." (p. IV.1) and "...enlarge the economic base" (p. I.1) of Georgetown County. There is absolutely no basis for concluding there will be a net gain of either. In our opinion quite the opposite is true; specifically, there is every reason to believe that there will be a net economic loss to Georgetown County. Clearly, no professional economic (or social) analysis has been presented, nor experience in other communities having refineries. The answers are not provided in Section VI-f.

Therefore, in the FEIS there should be a professional analysis of the following:

a) To what extent would a refinery depress the tax base and tax revenues & the value of real estate and the attractiveness of Georgetown County to other business investment? The "Jersey Turnpike Effect" is well known; that is, communities with oil refineries are considered to be ugly and dirty and have poor general real estate values. They also do not readily attract "clean" industry and commerce investment. What are the tax losses associated with this?

b) To what extent would a refinery depress the general economic base of Georgetown County? There are many aspects of the County's economic future that would be threatened by the refinery. For example, the following important economic segments depend upon resources that would be jeopardized by the refinery:

- o aquaculture
- o hunting economy (duck clubs, game management areas)
- o tourism economy
- o recreational fishing
- o commercial fishing
- o outdoor recreation economy
- o research
- o other related economic sectors

Probable losses to these sectors must be subtracted from any claimed benefits to get the net effect.

c) To what extent would the refinery reduce options to bring in other cleaner industry and what are the probable job losses and other economic effects of this? A refinery would use up pollution increments that could be available for more job-producing industry -- a refinery is not labor intensive and therefore offers the least jobs for the amount of investment. Also, the "Jersey Turnpike Effect" would discourage other cleaner and more job-producing industries from coming to Georgetown -- which is already distressed economically because potential new industries, repulsed by the present heavy industry in town, are not coming to Georgetown.

The refinery site is outside Georgetown in an area zoned for industrial development and is isolated from other developments so it should not depress either the tax base or real estate values of adjacent property. The adverse effects attributed to oil refineries may be overstated in view of the air and water quality standards the refinery would have to meet to obtain the necessary permits.

The refinery would enhance the economic base of Georgetown County to the extent of its contribution in payrolls, taxes, products, etc. It would depress the economic base to the extent it interfered with or precluded other activities listed in this comment. However, compliance with the air and water quality permits the facility would have to obtain should prevent any unacceptable effects on these activities.

Any industry having air emissions would, by using part of the available increment, leave less increment available for other potential new industries. Georgetown has for some time sought additional industry and apparently believes the refinery is an acceptable development. As noted in the response to comment AV-3, the refinery site is outside Georgetown, is in an area zoned for industrial development, and is also isolated from other developments. Therefore, the "Jersey Turnpike Effect" may not be a significant issue in this situation.

A 7-6

- d) What other uses could the S.C. Ports Authority make of their Harmony property? The Ports Authority is the owner of the property, not CRDC, and they should be asked to supply information on what alternative uses SPA could make of the property other than building a refinery on it. This would provide the appropriate land use alternative for the property.

A 7-7

- e) To what extent would the refinery cause negative social impacts? There is no consideration of the many negative social impacts of the refinery. A refinery is a degrading land use from the viewpoint of livability ("Jersey Turnpike Effect") and attractiveness and healthfulness of the community. These factors need to be balanced off against the handful of jobs created for local people (Note: a busy boatyard or light assembly/manufacturing plant would employ more than 90 people). The impromptu poll taken at the recent hearing showed that a high percentage of local people see a socio-economic dibenefit from a refinery. Only a thorough professional analysis will reveal whether there is a net gain or loss socially and it should be provided for the FEIS.

A 7-8

- 3) Provide a regionally based analysis of need and economic benefit for the FEIS.

The Georgetown/Charleston area is already being provided its needs for various petroleum products. To a large extent, the proposed refinery would not generate new markets but would merely compete for present markets and would displace jobs and sales by present suppliers. The regional net benefit would be the net gain from balancing loss of revenues and jobs by present suppliers against gains from a new supplier (CRDC).

Your attention to including the above in the FEIS along with the attached list of additions to the FEIS will be appreciated. Additional concerns will be forwarded directly to your office by my principal client, the Yawkey Foundation.

A 7-9

- 1) Include other realistic alternatives in FEIS. There appears to be no substantial reason for restricting the alternatives examined to those in DEIS. The Corps is responsible for coming up with the alternatives in this type of analysis, not the applicant. There is not sufficient reason given for excluding Savannah and Wilmington for serving the public need as stated. Also there are not alternatives for overland supply of crude. Nor has there been a recent study for offsets in Charleston--the situation could have easily changed in the last several years.

The State Ports Authority purchased its Harmony Plantation site primarily to provide the Corps with a disposal area for the maintenance dredging of Georgetown Harbor. The State Ports Authority also intended to use other portions of its property for industrial development. At this time, the oil refinery is the only industry planning a facility at Georgetown. Table VII.D-8 lists the various types of industries considered for Georgetown in a study done for the State Ports Authority.

As noted in Section VII.D of the DEIS and in responses to other comments in this letter, the relative isolation of the refinery site should preclude the negative social impacts that are a concern in this comment. With reference to the preferences of the local people, the voters in the June 12, 1984 Democratic Primary in Georgetown County were offered a chance to vote on the refinery. According to the June 13 issue of the Georgetown Times, 3,887 people said they favored the refinery, while another 3,363 said they would be in favor of the facility if safeguards are taken to protect the fishing and tourism industries. Votes cast against the refinery numbered 1,308.

See the response to comment AV-2.

See the response to comment AR-8 regarding the selection of alternatives. The reason the Savannah site was not analyzed in detail is given on page V.2. Although the Savannah site would satisfy the public need, it would not satisfy the applicant's need. With regard to the Charleston site, Alumax of South Carolina has recently obtained a variance to increase its emission of sulfur dioxide; consequently, the prospects of CRDC being able to obtain an offset have decreased.

A7-10

- 2) Include additional state responses. Add to the state responses on page V.7 those that were unfavorable--the present list has an unfortunate appearance of being biased and lacking in balance. E.g., the S.C. Wildlife Commission has formally opposed the refinery and this should be listed.

- 3) Make other clarifications to item 1., p.V.7. Clarify if the certificate referred to in item b. is for construction only or for operations too. Remove item e. as it refers to no action taken by an agency.

A7-11

- 4) Reconcile different numbers. The production of JPL on p.VII.A-4 does not agree with that on p.IV.1; correct the error/explain difference. Also  $NO_x$  on pp.II.2 and VII.A-11 do not agree.

A7-12

- 5) Evidence of confirmations. Since the applicant is in a strong advocacy position the Corps should check and verify the data and estimates furnished by applicant and his agents (e.g. the material ascribed to Catcart, 1983b). Please provide evidence of independent check and verifications.

A7-13

- 6) Improve presentation of air quality data. The discussion about air quality is hard to follow because the expected emissions and A.Q. limits are not displayed for easy comparison. Please provide a simple table of comparison.

A7-14

- 7) Add information on pollution effects. In Sect. VII.B please furnish information on effects of pollutants on the ecology, biota, foodwebs, etc of the river and bay. Much of the water quality problem lies beyond how much chemical is in the water to how is the natural ecosystem of the waters actually affected.

B-124

A7-15

- 8) Discuss penetration of oil into watersystems. Any oil entering the various water systems of experimental and production systems for aquaculture, waterfowl, etc could have most serious impacts. Therefore, please furnish detailed information on the penetrations into the Yawkey Wildlife Center water systems, those at Annandale, and others around the bay, for each of the scenarios. Great economic losses (e.g. permanent loss of ponds, canals, etc) could occur.

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

The JP4 fuel production rate given on Page IV.1 has been corrected. The correct value is 8,151 barrels per day as stated in the table on Page VII.A-4.

The  $NO_x$  emission rate given on Page VII.A-11 is correct. The tables on both Page II.2 and Page VII.A-30 have been corrected to show an estimated  $NO_x$  emission rate for the CDC refinery of 485.6 metric tons/yr. (535 tons/yr.).

The Corps and cooperating agencies and EPA's consultants have evaluated the information provided by the applicant and his consultants and find it to be reasonable. However, as noted in Part VII.B of the DEIS, some adjustments to effluent components were made pursuant to current water quality regulations.

Comparison of air quality standards and pollutant impact estimates is given in the table at the top of Page VII.A-20.

Section VII.B deals specifically with water quality; the other information recommended for inclusion in this section is addressed in Section VII.C.

Oil spills in a number of scenarios presented in the draft EIS could impact the shorelines and hence enter various water systems of the Yawkey Wildlife Center. Scenarios that could create such impacts include Cases 6, 7, 10, 11, 12, 14, 15 and 17; smaller potentials exist for Cases 9 and 13. The Annandale Plantation area could be affected by Case 10. Considering the generalizations and assumptions inherent in the spill scenarios, it is not reasonable to provide detailed information on the spill impact to all contiguous water systems. A qualitative assessment could be made that, if some of these spill scenarios actually occurred, impacts to these water systems also may occur to some extent. The potential effects of oil on aquatic resources in and around Winyah Bay is addressed by the DEIS in pages VII.C-1 through 72.

- 9) Assess effectiveness of spill control. To understand the effects of a spill on the resources of the bay one must have a measure of the realworld effectiveness of spill control procedures. Under what conditions do they work well or poorly. The methods could be theoretically good but not work in practice giving an entirely different perspective to the results of a spill. For example on p.VII.B-101 the DEIS states that it would be difficult or impossible to clean up spills during heavy weather when they usually occur. Therefore, without a measure of effectiveness it would be difficult to conclude the level of risk to the resources that would be lowered by spill control. Note 5-15% effectiveness on p.VII.B-106.

10. Verify spill response capability. Ref. p. VII.B-110. Applicants statements should be verified. E.g. it does not appear realistic that CRDC could have a control crew at any spill site in the bay in 15 minutes. That would be a marginal possibility for the water adjacent to the plant site only it seems.

11. Assess economic losses. The great damage that the refinery will cause, or threatens, to bay resources should be assessed economically and equitably and balanced against any apparent gains to get a net benefit. Also discuss indemnification against such losses.

12. And missing information. P.I.A.s re public involvement, add information on the public involvement, date of second scoping meeting, description of the public involvement between a public hearing and instructions to prepare an EIS.

13. Provide specific information on spill control/contingency plans. Appendix A is mostly talking about general matters, and is not helpful in judging what is taking place in the bay in event of a spill. There are a few things to be aware of, conditions, etc and therefore it is of no value to an environmental assessment. Contingency plans are needed that are specific to bay before any evaluation of possible effects can be made. Please furnish.

The reviewer appears to have answered his own questions. The DEIS addresses the factors that impair the effectiveness of clean-up operations on page VII.B-101 and the reviewer has cited a conclusion from this page. As noted by the reviewer, the DEIS states on page VII.B-106 that recovery rates of oil range from 5 to 15 percent in offshore areas to 20 to 50 percent in inshore areas. The latter category is qualified on page VII.B-110 by the statement that no clean-up work may be attempted in inshore areas because of a concern that damage from clean-up operation may be greater than the damage from the oil itself. A summary statement addressing spill control and cleanup has been added to page VII.B-111.

It is not practical to actually verify how quickly a refinery crew can be mobilized for a spill where there is neither a refinery nor a crew with equipment available. However, all information submitted by the applicant will be evaluated for reasonableness and practicality by the South Atlantic Division Engineer in making the decision on this permit application. Pages VII.B-110 and VII.B-111 have been revised to show that CRDC crews cannot be expected to respond to any oil spills that are not associated with the refinery or unloading at the pier. In addition, the EIS states on page VII.B-110 that it would be extremely optimistic to expect the 15-minute response time reported by the applicant.

Page VII.D-2 has been revised to address potential damage to the economic base caused by losses in productivity of aquatic resources due to the oil refinery.

Additional information has been added on the scoping meeting; a second scoping meeting was not held. All public involvement between the 1982 hearing and the instruction to the Charleston District to prepare an EIS is addressed in the DEIS.

The Corps asked the applicant to provide a spill contingency plan that would cover to the maximum extent possible at that time the requirements of the Operations Manual (OM) and the Spill Prevention Control and Countermeasure Plan (SPCC Plan). The plan provided by the applicant is presented in the DEIS. The OM and SPCC Plan are not required before the facility begins operations. For evaluation purposes, reviewers can assume that the EPA and Coast Guard would require the refinery to incorporate those measures, including the use of specific types of equipment and specific procedures, that would achieve the purposes of each plan. The requirements of these two plans are addressed on pages VI.C-7 and 8.



## SIERRA CLUB South Carolina Chapter

To explore, enjoy and preserve the nation's forests, rivers, wildlife and wilderness

P. O. Box 8296, Columbia, SC 29202

May 28, 1984

Lt. Col. F. Lee Smith, Jr.  
District Engineer  
U. S. Army Corps of Engineers  
P. O. Box 919  
Charleston, S. C. 29402

Re: Carolina Refining and Distributing Company  
P/N 79-5R-319

Dear Col. Smith:

The Sierra Club submits the following comments in connection with the Draft Environmental Impact Statement (DEIS) for the proposed Carolina Refining and Distributing Company (CRDC) oil refinery.

### I.

The DEIS clearly demonstrates that the preparation of a full EIS for this refinery was fully justified. The portions of the DEIS prepared by the Environmental Protection Agency (EPA) and the U. S. Fish & Wildlife Service (FWS) thoroughly document a number of significant adverse environmental impacts arising from the operation of this refinery.

In contrast to the documented thoroughness of the EPA and FWS portions, however, the sections written by the Corps are generally sketchy, conclusory and lacking in documentation.

The DEIS, and particularly the statements on page V.7, reveals the Corps' continuing bias in favor of this project. Undocumented and questionable assertions of alleged economic benefits of the refinery have been accepted without question, while scientifically established statements of negative environmental impacts, written by EPA and FWS experts, are treated with skepticism and rejected. The bias is further shown by the DEIS' failure to discuss the

See the responses to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table, and to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. Page VII.D-2 has been revised to address potential damage to the economic base caused by losses in productivity of aquatic resources due to the oil refinery.



Col. Smith  
May 28, 1984  
Page 2

economic threat this refinery presents to existing jobs in the fishing, research and tourism industries.

In rejecting the findings of the EPA and FWS, the Corps appears to be violating National Environmental Policy Act (NEPA) regulations which require the EIS to "serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made." The stated reasons for the Corps' rejection of the EPA and FWS findings are, as will be demonstrated later in these comments, both unsupported by scientific analysis and legally insufficient. Since the Charleston District has continuously expressed a desire to issue the permit for this refinery, the assertions on page V.7 and the chart at V.8 appear to be blatant attempts to justify a decision already made.

When the Charleston District announced in 1983 its intention to issue this permit without an EIS, the asserted justification was that the refinery's purported economic benefits would outweigh its negative environmental impacts. Since a final decision has been postponed pending this EIS, the Corps is still charged by law with making a full evaluation and consideration of all of the environmental consequences of the refinery. The EIS should contain a detailed and objective statement of the negative impacts, to insure that the Corps' final decision is made on complete information and complies with NEPA.

The decision on this permit must serve the public interest, and the applicant has the burden of proving that this refinery would be in the public interest. If the claimed economic benefits are to be considered in the final permitting decision, they should be subjected to rigorous objective analysis, as are the environmental costs. Many serious questions have been raised about the economic feasibility of this refinery. To accept CRDC's undocumented claims without question, while rejecting scientifically documented evidence of the adverse environmental impacts, would be a gross disservice to the public interest.

## II.

Specific comments on the various portions of the DEIS are set forth below:

Need for a refinery. On page II-2, it is stated that the "public need for this refinery is represented by the demand for refined petroleum products." Upon what basis does the Corps conclude that any unmet demand for such

The purpose and need for the proposed refinery is addressed to the extent required by Corps of Engineer policy contained in 33 CFR 230 App. B 11(b)(4).

products exists? Indeed, the DEIS contains no data supporting any conclusion that there is any "public need" for this refinery. To the contrary, on page VI.F-11, the DEIS acknowledges that the demand for petroleum products is being met by existing oil jobbers.

A-3

Economic conditions. Also on page II-2, it is stated that the "favorable environmental impacts" of the refinery would be to "enlarge the economic base of Georgetown County, one of the most economically depressed counties in South Carolina." The DEIS, however, contains no data regarding the economic conditions of Georgetown County relative to the rest of South Carolina.

A-4

Employment. Similarly, the DEIS lacks documented support for the statement on page IV.-1 that 90% of any jobs created by the refinery would be filled by "locally hired people." Is there any evidence at all that 90% of the types of workers needed by such a refinery could be found among the unemployed of Georgetown?

A-5

Alternatives. The DEIS' discussion of alternatives is insufficient, primarily because it focuses simply upon alternatives available to the applicant. The discussion of alternatives should approach the question from the standpoint of the public interest and public needs, not that of the applicant and its private desires. If the "public need" for this refinery is the "demand for refined petroleum products," then any investigation of alternatives should focus on meeting that "need." Under the "Permit Denial (No Action" alternative, it should be noted that the "public need" would continue to be met by local oil jobbers.

A-6

Economic impacts. Generally, the DEIS' discussion of economic impacts of the refinery appears to be biased in favor of the alleged positive impacts. Multiplier and secondary positive impacts are discussed in some detail, while the potential negative economic impacts are not addressed. While acknowledging that Georgetown has 400 existing jobs in fishing, at least 53 jobs in research and support roles at Baruch (the DEIS omits any listing of the number of jobs provided by the Tom Yawkey Wildlife Center), and 956 jobs in the tourism industry, the DEIS makes no attempt to analyze the refinery's potential impacts on these important economic bases. Also, despite several recent studies in the U. S. of the economic value of wetlands, the DEIS makes little mention of the lost economic values represented by marshes destroyed by an oil spill. The final DEIS should clearly state and summarize the economic impacts of fishing (including shrimping and crabbing, etc.),

Employment statistics for Georgetown County have been added to page VI.F-17.

The source of the data on the number of employees and their average wage is the study by Davis and Floyd Engineers, Inc. and Arthur D. Little, Inc. which is cited on page VII.D-2. In view of the numbers of skilled workers laid off at International Paper Company and Georgetown Steel, there are probably enough skilled workers available to meet the refinery's needs.

One of the two major purposes of the scoping meeting held by the Charleston District on 22 July 1983 was to determine what alternatives should be addressed in the DEIS. The Corps presented what it believed to be a full range of reasonable and practicable alternatives for consideration in the DEIS and no one in attendance suggested that additional alternatives should be addressed. Mr. Chandler attended the scoping meeting but did not suggest a need for additional alternatives until this letter which was submitted after the public review period had expired. Table V.1 shows no socio-economic impacts under permit denial.

Page VI.K-2 has been revised to show the value of management programs at the Yawkey Wildlife Center. Page VII.D-2 has been revised to address the economic losses due to a potential reduction in the productivity of aquatic resources. With regard to fishing and tourism, the DEIS states on page VI.D-29 that recreational fishing pressure in Winyah Bay is low in comparison to other estuaries in the State and on page VII.D-1 that the major part of the tourist industry in Georgetown County is concentrated along the coast north of Georgetown and should not be affected by the refinery.

research and tourism, and discuss negative impacts on these industries arising from refinery operations and oil spills.

Hazardous waste. On page VI.C-5, the DEIS mentions hazardous wastes from the refinery, but only cursorily. The final EIS should discuss in detail the amount and characteristics of each type of hazardous waste generated, the hazards posed, the methods of transport, safety considerations, and whether the SCA Services landfill is suitable for each type of waste. Since SCA Services operates the only licensed hazardous waste landfill in South Carolina, and since its capacity is finite, the final EIS should also discuss disposal alternatives.

Tanker fleet. On page VII.B-38, the DEIS states that "the casualty exposure factor based upon fleet composition is perhaps the single most important factor influencing the outcome of an oil spill risk analysis." On page VII.B-40 it is acknowledged that "[t]here is a lack of information on characteristics of vessels serving the proposed refinery." The DEIS only indicates that the shallow depth of Winyah Bay will limit tanker traffic to those of 20,000 DWT or less, which have an oil volume of approximately 140,000 barrels. It is our understanding that vessels of 20,000 DWT or less are exempt from many tanker safety regulations, and that as a group, 20,000 DWT tankers are generally the oldest in the overall world tanker fleet. It appears that with the advent of "supertankers," no shipbuilder has built new tankers of 20,000 DWT or less in many years. It is thus likely that CRDC will be served by an aging fleet of spot-market foreign tankers not equipped with the latest safety features. The DEIS makes no mention of these factors, despite acknowledging the importance of tanker fleet composition. The final EIS should include an informed discussion of the characteristics of tankers likely to serve CRDC (a worst-case analysis if necessary on this point), and the oil spill analysis should be re-evaluated in light of the CRDC tanker fleet.

Existing water uses. The listing of existing water uses on page VI.C-24 omits mention of the use of Winyah Bay for fishing and shrimping by commercial and recreational fishermen.

Process water. Although the DEIS states on page VII.D-1 that "process water for the refinery will be provided by deep wells on-site," it fails to discuss the impacts of this withdrawal of groundwater. Georgetown County has been designated a Capacity Use Area by the South Carolina Water Resources Commission, yet the DEIS does not mention this factor, nor the amount of water CRDC will use, nor its effect. The final EIS should thoroughly discuss all groundwater impacts of the refinery.

The requirements for a RCRA permit are addressed on page VI.C-5 and indicate that compliance with existing regulations should prevent any significant adverse impacts from hazardous wastes. The refinery design has not reached the point that specific details of storage and disposal can be provided.

Certain classes of ships are exempt from some parts of the regulations administered by the Coast Guard but none are exempt from navigation and pollution prevention requirements. The regulations applicable to tanker ships are addressed on pages VI.C-7 and 8.

The use of Winyah Bay for fishing is noted on page VI.C-25.

Page VI.J-3 has been revised to address the estimated requirements for process water. As stated therein, a permit would be required to use ground water because Georgetown County has been designated a Capacity Use Area. Page VII.H-2 has been revised to address the impacts of this withdrawal of ground water.

Tourism impacts. The statement on page VII.D-1 about impacts on tourism ("not expected to have significant adverse impacts") appears to be "off-the-cuff", undocumented, and simply insufficient. The City of Georgetown over many years has been encouraging and developing tourism in Georgetown proper, yet this section omits any reference to that tourism and the refinery's impacts on that tourism. The cursory treatment at VII.D-1 should be expanded in the final EIS to present a thorough and documented analysis of tourism in Georgetown and how it would be impacted by the refinery and potential oil spills.

Secondary development. The section on secondary development (VII.D-2 to VII.E-1) is quite sketchy and largely begs the question. While acknowledging that potential secondary development would include coke facilities, chemical plants, and plastic and synthetic fiber plants, the DEIS fails to include even a "quite general" evaluation of the environmental impacts associated with any of these types of facilities. The limited discussion provided in the DEIS clearly does not meet the NEPA requirement of consideration of cumulative impacts. At a minimum, the final EIS should include an identification of the potential adverse environmental impacts of foreseeable secondary development, including coke facilities, chemical plants, and plastic and synthetic fiber plants.

The DEIS also ignores the refinery's potential impact on further port development and its potential impacts on Winyah Bay. At a minimum, the final EIS should discuss the refinery's impact on the port of Georgetown cost-benefit study being currently conducted by the Corps.

Oil spills on land. On page VII.H-2 of the DEIS, it is acknowledged that "[i]n order to evaluate the impacts that might result from an oil spill [on land], more information would be necessary on the hydrology and hydraulic factors of the area and the use that is being made of the aquifer." CEQ regulations require that where there are gaps in relevant information, and the information is essential to a reasoned choice among alternatives, either the information should be obtained, or a worst-case analysis should be done. 40 CFR 1502.22. Here, the DEIS admits that the impacts of an oil spill on land cannot be evaluated. CRDC should be required to provide the information required for such an evaluation, and the evaluation should be

Tourism in Georgetown and vicinity is discussed in detail on pages VI.F-11 through 14. Since the refinery is in an isolated part of Georgetown County and far removed from any of the tourist attraction discussed in Section VI.F, it should not significantly affect tourism. Section VII.D-1, wherein impacts are addressed, is appropriately brief, noting the physical separation of the refinery from tourist attraction that precludes any significant adverse impacts.

The DEIS states that the applicant does not have any plans for additional development nor does he have any specific requirements for additional development by others. There are also no known plans by any other industry for development in this area. The DEIS then addresses in general terms the impacts on air and water quality, land-use changes, and demands on public services of potential secondary industrial development. The applicant has stated that he does not need a deeper navigation channel in Georgetown Harbor. The proposed refinery has not been addressed in the Federal study of improvements to Georgetown Harbor.

Page VII.H-2 has been revised to further address the potential for pollution of aquifers by an oil spill. As stated therein, the proposed refinery does not pose a significant threat to ground water resources.

included in a supplemental draft EIS. In the alternative, a worst-case analysis should be performed.

### III.

Perhaps the most glaring and inexcusable fault in the DEIS is the entire text of page V.7. It is our understanding that the Corps engaged the EPA and FWS to prepare portions of the EIS due to the expertise these agencies would bring to the process. In a thorough manner, the EPA and FWS prepared careful and well-documented analyses of the impacts of this refinery. Yet the Charleston District "does not concur with the significance attributed [by the EPA and FWS] to some impacts." Page V.7 goes on to list the "major factors supporting the views of the Corps of Engineers." The Sierra Club submits that these "factors" provide no basis for the rejection of the EPA and FWS findings. Indeed, an analysis of these "factors" clearly reveals the weakness of the Corps' position:

A. As to the "findings of various State agencies as evidenced by permits and certifications":

1. The DHEC air quality permit, issued in 1979, expired in 1982. Since that time, additional studies have concluded that the CRDC emissions could use up "an excess of 100 percent of the allowable SO<sub>2</sub> increment" for the Georgetown area, and that "there could be violations to air quality standards for non-methane hydrocarbon and ozone." The DEIS states that "[a] more detailed study with specific information and data would be required in order to more accurately define the air quality impacts." CRDC must re-apply for an air quality permit, more stringent requirements have been imposed since 1979, and CRDC has made no showing of ability to meet those requirements. Clearly, the issuance of a permit in 1979, that has since expired, is no evidence supporting rejection of the EPA findings.

2. DHEC 401 Water Quality Certification. Contrary to the assertion on page V.7 of the DEIS, DHEC's water quality certification considered only the pipeline, not the entire refinery operation and potential oil spills. Where, as here, an NPDES permit is required, DHEC employs a narrow analysis for 401 Certifications, considering only the narrow matter (in this case, the pipelines) being permitted by the Corps. Neither the wastewater discharge nor potential oil spills were considered under the 401 certification.

3. Coastal Council certification. Although the Coastal Council issued a certification of this refinery in

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

1981, its certification was conditioned upon completion by CRDC of an updated and substantially improved analysis of the refinery's impacts on the ecology of Winyah Bay. By imposing this condition, the Council acknowledged that more information on ecologic impacts was needed. The portions of the DEIS written by the EPA and FWS provide substantial new documentation of this refinery's negative impacts on the ecology of Winyah Bay. By its express conditions, the Coastal Council's certification provides no support for the Corps' rejection of the EPA and FWS conclusions. It should also be noted that the South Carolina Wildlife Federation's challenge to the validity of that certification is still pending in the Supreme Court of South Carolina.

4. Water Resources Commission (WRC)  
recommendation. Although the appointed board of the WRC recommended issuance of a state permit, the professional staff of the WRC recommended denial. The state Wildlife and Marine Resources Department has appealed the WRC recommendation to the State Budget and Control Board, which has not yet made a decision. In addition, the WRC recently appointed a subcommittee to study whether WRC should re-consider its recommendation in light of the Corps' EIS.

5. NPDES permit. CRDC must re-apply for an NPDES permit, since it failed to respond to DHEC's request for comments on a proposed draft permit in 1981. The EPA states on page VII.B-26 of the DEIS its finding that a "degradation of Sampit River and Winyah Bay would occur as a result of the process water discharge from the proposed CRDC refinery." The Corps has presented no factual or scientific analysis which justifies rejection of this finding.

B. As for the Corps' version of the "[p]rojected effects of refinery operation", the statements on page V.7 are incredibly simplistic and clearly not based on scientific reasoning. The analyses prepared by the EPA and FWS thoroughly document significant adverse impacts on the biology of Winyah Bay. The Corps' purported justification for rejection of these scientific findings is based neither on facts nor objective analysis, but rather appears again to be simply an attempt to justify a decision already made.

C. As for spill probabilities, the Corps apparently desires to reject any consideration of oil spill impacts. We are unable to find in the DEIS any factual support for the Corps statement that the "probability of occurrence of a large spill does not lie within the probable life span of the refinery (approximately 50 years)." The EPA discussion of oil spill probabilities indicates a much greater

likelihood for a spill of less than a total vessel loss. The analysis of oil spill scenarios also indicates, at page VII.B-91 for example, that relatively small spills of 2,690 barrels could result in significant long term damage. As noted by the EPA, "oil spills are reasonably foreseeable events associated with the permitting of the proposed refinery," with "significant adverse impacts." The EPA analysis also thoroughly documents the limitations of oil spill clean-up measures.

Many other sections of the DEIS could be cited to point out the flaws in the V.7 statements. The overall DEIS clearly shows that any failure by the Corps to carefully consider oil spill impacts of this refinery would be illogical, prejudicial and irresponsible. Again, the page V.7 statements appear to be an attempt to justify a decision already made.

Pages V.7 and V.8 should be deleted from the final EIS. The statements they contain have no place in the EIS, which must be a "full and fair discussion of significant environmental impacts", "supported by evidence that the agency has made the necessary environmental analysis." 40 CFR 1502.1.

The Sierra Club urges the Corps of Engineers to carefully re-evaluate its position on this refinery, and to adopt the recommendations outlined in this letter.

Yours very truly,

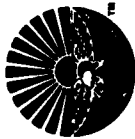
SIERRA CLUB, South Carolina  
Chapter

By:   
James S. Chandler, Jr.  
Coastal Issues Coordinator

JSC/j

cc: Honorable Richard W. Riley  
Honorable Strom Thurmond  
Honorable Ernest F. Hollings  
Honorable Robin Tallon

22/55



# NATIONAL WILDLIFE FEDERATION

SOUTHEASTERN NATURAL RESOURCES CENTER

1033 Wade Avenue, Suite 207  
Raleigh, North Carolina 27605

May 29, 1984

*Rec'd 31 May 84*

Mr. John Carothers  
U. S. Army Corps of Engineers  
Charleston District  
P. O. Box 919  
Charleston, SC 29402

Dear Mr. Carothers:

The National Wildlife Federation, the nation's largest private conservation education organization with over 4,000,000 members and supporters and our affiliate the South Carolina Wildlife Federation, would like to compliment the U. S. Army Corps of Engineers on preparing the Draft Environmental Statement for the proposed Georgetown oil refinery. We believe that a project with such a potential for serious environmental degradation was rightly subject to the detailed analysis provided in the EIS. I discussed many of our concerns in my oral testimony on April 26, and these written comments will supplement those.

The information provided by the Environmental Protection Agency, the USFWS, and the USGS all indicate that the environmental consequences of operation of the proposed refinery will likely be severe. These agencies provide documentation and strong arguments against permit issuance by the U. S. Army Corps of Engineers.

Concerning air quality EPA contends that "there can be violations to air quality standards and ozone." "There is also the possibility that the proposed refinery could consume all of the remaining 24-hour SO<sub>2</sub> increment in both the Georgetown Class II area and the Class I-area of Cape Romain." EPA's water quality analysis discussed a number of alarming possibilities. "The oil and grease components of the wastewater effluent also could increase ambient levels of oil and grease in the river and bay." . . . It is expected that most oil and grease components of the wastewater would sorb to suspended particles in the vicinity of the outfall and settle into the sediments. This process could create a large cumulative impact to river, and subsequently bay sediments over time."

"Future creation of a dredge spoils disposal point near the Harmony Plantation site is planned (Carothers, personal communications, 1983). Runoff from such a disposal site could increase the level of suspended particles in the Sampit River near a proposed refinery outfall. This could result in an increase in the potential for sorption and deposition of refinery wastewater pollutants in



the Sampit River near Pennyroyal Creek. The cumulative impact on the sediments in this area would be far greater than for farther downstream in the river or for locations in the bay, because tracer studies and mathematical modeling have demonstrated that refinery pollutants can accumulate in this vicinity and that flushing capability will be less than for downstream areas."

"Impacts to water quality in the Sampit River and Winyah Bay expected as a result of building and operating the proposed refinery could be significant with respect to a number of pollutants. Significant ambient level increases for pollutants in the Sampit River sediment and water column may be expected. Although not specifically tied to development of the proposed refinery, further industrial development in Georgetown may be positively influenced by the presence of the refinery. Impacts on water quality from future industrial development could be significant. The cumulative effects of pollutant discharges from existing and reasonably foreseeable future sources, together with those of the proposed refinery, could be to increase concentrations of certain constituents to unacceptable levels."

In considering oil spill scenarios low probabilities are given for catastrophic oil spills. It is important to note however that two significant oil spills have occurred in nearby areas. In 1982 a 4,000 barrel and in 1983 a 1,000 barrel spill occurred within the Cape Fear river system near Wilmington, North Carolina. In both cases the responding agencies were unable to contain the spill and marsh vegetation along the river was heavily coated and subsequently killed or weakened. Existence of a spill prevention and countermeasures plan and the operations is no guarantee that spills will actually be contained. In addition oil became incorporated into river sediments. It should be noted that due to its much more expansive marsh system and generally low water velocities the Winyah Bay system is much more sensitive to oil spills than is the Cape Fear. Within the Winyah Bay ecosystem gradual releases of oil, grease, and other pollutants can also have serious consequences on water quality and fish and wildlife habitats.

The value of the Winyah Bay system as fish and wildlife habitat is very well documented by the U. S. Fish and Wildlife Service. Over 60,000 acres adjacent to Winyah Bay have been set aside in recognition of their values for research, conservation and education. The fish and wildlife habitats of the bay system are of national significance as a haven for endangered and threatened species as well as protected species, Species of Special Emphasis, wading birds and migratory waterfowl. The bay provides valuable nursery and feeding habitat for commercially and recreationally important fish and shellfish species, the principal anadromous fishery in the State for shad and sturgeon and an important fishery for striped bass and herring. A large portion of Winyah Bay is bordered by productive marsh wetlands; with 80% of the shoreline environments of the bay falling into the most sensitive categories with respect to oil spills."

Section VII, C-18- and C-19 clearly document the effects of chronic discharges of the refineries effluents an aquatic life. Consequences of harbor dredging on dispersal of effluents associated with the refinery are discussed in section VII.C-20. Impacts of any spills on the Winyah Bay area are included in VII.C-21, C-22 and C-23.

A number of endangered species inhabit the project area and the shortnose sturgeon is most vulnerable to water pollution. National Wildlife Federation's fishery specialist Dr. Rudolph Rosen has provided comments concerning this species (attached). I have also added comments to Dr. Rosen's letter concerning declines in the related Atlantic sturgeon fishery in Winyah Bay system.

Rulifson, Huish and Thoesen, 1981 in a U. S. Fish and Wildlife Service review of Andromous Fish in the Southeastern United States made a number of observations about both Atlantic and Shortnosed Sturgeon in the Winyah Bay area. "In 1897 sturgeon landings of 411,000 pounds of meat and 70,000 pounds of caviar occurred in South Carolina." "Since then landings have sharply dropped and have not shown recovery." "Today over 90 percent of commercial landings occur in the Winyah Bay system." "Declines in the sturgeon population may have been due to habitat loss from dams, pollution and overfishing." The authors subsequently point out sturgeon's intolerance to water pollution. "Pollution apparently plays a major role in habitat abandonment by Atlantic sturgeon." "The Sampit River at Georgetown, South Carolina had heavy industrial pollution for 30 years, and sturgeon disappeared from the river shortly after the pollution began entering the river." "Sturgeon also disappeared from the Lynches River after a wool scouring plant began dumping wastes in 1957."

B-136

IX-1

The authors point out that habitat requirements for the shorthose sturgeon are similar to the Atlantic sturgeon. For these reasons and those cited by Dr. Rosen we feel that establishment of the proposed refinery would have adverse impacts on both populations of the endangered shortnosed sturgeon and the more abundant Atlantic sturgeon.

Section VII.C-54 and C-55 provide compelling evidence why Winyah Bay is unsuitable as a refinery site. Work by oil spill specialists such as Dr. E. R. Gundlach have indicated that sheltered tidal flats and marshes are the most sensitive environments to the effects of oil spills.

In describing the economic effects of the proposed refinery the Corps of Engineers discusses new jobs that will be created by the refinery operation. The analysis should also include potential adverse economic impacts such as job losses from the over 400 commercial fishermen in the area as water quality is degraded.

IX-2

Page VII.D-2 has been revised to address the potential economic losses in commercial and recreational fisheries due to refinery effluents and oil spills. See also the response to comment AS-2 regarding the possible loss of jobs in the fishery industry.

See the response to comment AF-2 regarding compliance with the Endangered Species Act.

Eleven full-time fish dealers utilize the resources of Winyah Bay. A number of research projects conducted in the area at the Baruch Institute of Marine Research could be adversely impacted by degradation of Winyah Bay. The potential for Georgetown to increase tourism centered around the areas rich history or as an alternative to the Grand Strand may well be reduced by location of the refinery there. A more balanced investigation of jobs gained versus those that may be lost should be included in the final EIS.

The resource values of Winyah Bay and projected refinery impacts are included in VII.C-56,57 and 58. This information argues strongly against permit issuance. The USFWS Service says this very well in VII.C-58.

"The Winyah Bay system is unique and irreplaceable. Its abundant resources are of national significance. In terms of environmental considerations, the Fish and Wildlife Service believes the chosen site represents one of the worst possible sites in coastal South Carolina for an oil refinery. Based on the resources and impacts summarized in the above section and detailed in other sections of this document, the Fish and Wildlife Service believes the proposed project is incompatible with maintaining the ecological integrity, existing uses and abundant fish and wildlife resources of the Winyah Bay system.

See the response to comment AJ-2 regarding the comparison in Table V.1 of impacts at Charleston and Georgetown.

In the comparisons of alternatives by the U. S. Army Corps of Engineers (page not numbered), there are several inconsistencies in the sections on wildlife, fisheries, and endangered species. In evaluating the effects of alternative refinery locations in Georgetown and Charleston identical consequences to fisheries, wildlife and endangered species are projected. The values of the Winyah Bay ecosystem as habitat for these organisms far outweighs that of an industrial harbor such as Charleston. Identical results from comparisons of habitat effects in a lower quality environment such as Charleston Harbor to the Winyah Bay are unfounded.

The very great ecological values of Winyah Bay and its extreme sensitivity to refinery related pollution lead us to request permit denial.

Yours truly,

*Manley Fuller*

Manley K. Fuller III  
Wildlife Resources Specialist

Attachment



# NATIONAL WILDLIFE FEDERATION

1417 Sixteenth Street, N.W., Washington, D.C. 20036 202-797-6800

May 10, 1984

Elizabeth H. Spence  
Executive Director  
South Carolina Wildlife Federation  
Box 4186 #B-1  
4949 Two Notch Road  
Columbia, South Carolina 29240

Dear Betty:

I have reviewed the 8 July 1982 Biological Opinion of the National Marine Fisheries Service (NMFS) concerning impacts of Carolina Refining and Distributing Company's proposed Georgetown refinery on shortnose sturgeon and the response by Bernard Staleman, U.S. Army Corps of Engineers, dated 6 April 1983.

The NMFS concludes that operation of the refinery at Georgetown is likely to jeopardize shortnose sturgeon in Winyah Bay. NMFS offers to assist the Army Corps in relocating the refinery to a less sensitive area. Information presented in the NMFS Biological Opinion was accurate and very up-to-date. NMFS biologists did a good job with the relatively few data available on shortnose sturgeon. NMFS also indicated the Army Corps was unable or unwilling to provide additional information that would have allowed NMFS to address important concerns about shortnose sturgeon.

Major points by NMFS include the following:

Shortnose sturgeon are not known to move between river systems; therefore, each river contains a unique stock.

The status of shortnose sturgeon in Winyah Bay is poorly understood. No quantitative population estimates are available.

Winyah Bay may provide the most important "refuge" for shortnose sturgeon in its southern distributional area. The Bay is especially favorable to sturgeon because of the availability of deep water, food, and relatively unaltered estuarine and associated riverine habitat.

May 10, 1964

← *Atlantic Sturgeon decline continues* →  
 NMFS concludes Winyah Bay represents a "significant" portion of the known shortnose sturgeon range.

The NMFS case rests primarily on the potential catastrophic effects of a spill of crude or refined oil. Potential short-term and long-term effects on the population of shortnose sturgeon would be possible if such a spill were to occur. In addition, because of the long life span of the species and benthic feeding habits, it is likely even low levels of hydrocarbon pollution could lead to carcinogenic or other detrimental effects to the species' population in Winyah Bay. Such chronic effects could be hard to detect. Because the entire Bay is susceptible to the effects of oil, any amount of discharge would place shortnose sturgeon in contact with hydrocarbons. In addition, because of potential synergistic effects of hydrocarbons and other pollutants, it is possible the quality of shortnose sturgeon habitat and the fish's survivability could be degraded.

The Army Corps' review of the Biological Opinion generally attempts to refute data presented by NMFS. Some statements provided by the Army Corps are not well substantiated. In addition, some of their conclusions are inconsistent with the way in which I would interpret available data.

For example, the Corps states: "Past and recent records indicate that [shortnose sturgeon] were probably never abundant." I'm not aware of data that would indicate this to be factual. In addition, the Corps states there has been no "discernible adverse effects on shortnose sturgeon" as a result of present levels of discharge of pollutants to Winyah Bay. It is my understanding the Corps has no basis for this statement. No data presented by NMFS or the Corps could be used to document one way or the other what is happening or has happened to shortnose sturgeon in the Bay.

Moreover, the Corps makes a strong case for maintaining present conditions in the Bay when they state: "Evidence indicates shortnose sturgeon reproduction may occur in the Winyah Bay." I interpret the statement as admission of the critical nature of Bay area habitat, few locations on the river where are known positively as shortnose sturgeon spawning grounds. In addition, the Corps recognizes the species uses a wide range of habitats which by reasonable interpretation would indicate the species requires a wide range of habitat as well as in their life cycle. But, the Corps seems to indicate that if one habitat were destroyed sturgeon would not suffer because it has several other habitats available in the Bay it could live.

E. H. Spence

-3-

May 10, 1954

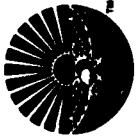
I hope the above brief analysis provides the information you need. Please contact me if you'd like to discuss shortnose sturgeon or the Biological Opinion further.

Sincerely,

Rudolph A. Rosen  
Fisheries Resource Specialist  
Fisheries & Wildlife Division

RAR:ks

B-140



## NATIONAL WILDLIFE FEDERATION

SOUTHEASTERN NATURAL RESOURCES CENTER  
1033 Wade Avenue, Suite 207  
Raleigh, North Carolina 27605

May 28, 1984

Mr. John Carothers  
U. S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, South Carolina 29402

Dear Mr. Carothers:

The National Wildlife Federation (NWF) appreciates the opportunity to comment on the Draft Environmental Impact Statement (DEIS) on a permit application by Carolina Refining and Distributing Company for an oil refinery at Georgetown, South Carolina. NWF is the nation's largest conservation education organization with over four million members and supporters.

NWF has closely followed the proposal to construct and operate an oil refinery at Georgetown, South Carolina. Winyah Bay and associated wetland and upland systems is a resource of national significance. NWF has submitted written comments and testified at the public hearing on the proposed permit. NWF has also commented on other specific actions during the permitting and scoping process. We were encouraged by the U. S. Army Corps of Engineers (USCE) decision to prepare an environmental impact statement on the proposed project but are somewhat dismayed at the disregard for the expert agency documentation and analysis by the USCE. We submit the following comments in three general areas: public need for the project, incorporation of expert agency documentation and analysis, and endangered species. These general comments are followed by specific comments on the DEIS.

### Public Need for the Project

The DEIS must include a statement of need for the project or proposal underlying the permit action. 40 CFR 1502.13. The USCE concludes that refinery products "would contribute to the fulfillment of energy needs of the region" by providing a "ready supply of refined products in the region." DEIS at IV.1. The USCE further notes that the refinery will have a positive effect on the local tax base and provide some local jobs. The DEIS does not fully and

The purpose and need for the proposed refinery is addressed in Section IV to the extent required by Corps of Engineer policy contained in 33 CFR 230 App. B. §11(b)(4). See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. See the response to comment AS-2 regarding the possible loss of jobs in the fishery industry. Page VII.D-2 has been revised to address the potential economic losses in commercial and recreational fisheries due to refinery effluents and oil spills. See the response to comment AW-11 regarding possible effects on tourism.

adequately address the question of public need for the project. The USCE provides no economic data to support the above conclusions. For example, with respect to jobs, the analysis should include potential adverse impacts such as job losses from the over 400 commercial fishermen in the area as water quality is degraded. Eleven full-time fish dealers utilize the resources of Winyah Bay. A number of research projects conducted in the area could be adversely impacted by degradation of Winyah Bay. The potential for Georgetown to increase tourism may well be reduced by location of the refinery on the Sampit River. A more balanced analysis of jobs gained versus those that may be lost should be included in the final EIS.

The NWF has in the past and continues to question the assumptions underlying the USCE statement of public need. Enclosed as an appendix and part of our comments on the DEIS is a letter of October 19, 1981 from Thomas G. Tomasello, Counsel, NWF to LTC. Bernard E. Stalman, District Engineer, Charleston District, USCE. The letter cites the following reasons supporting the conclusion that there exists no public need for the refinery:

- (1) The large amount of current excess refinery capacity in the U. S.;
- (2) Declining oil consumption in the U. S.;
- (3) The small size of the refinery and the inherent lack of sophistication of small refineries, especially their inability to modify product mixes;
- (4) The great propensity of major oil companies to meet changing product needs by retrofitting large existing refineries;
- (5) The economies of scale associated with larger refineries; and
- (6) The end of federal incentives for small refineries.

A full examination of these factors is essential to adequately assess public need for the project. This analysis will cast the decision in its true light and give the ultimate decision-maker an accurate assessment of the benefits of the action against which to weigh the environmental costs. References in the DEIS to marketing factors (DEIS at V.1) are a rationalization and not an examination of public need for the project.

#### Incorporation of Expert Agency Documentation and Analysis

Table V.1 on page V.8 contains a summary evaluation of alternatives by the USCE which assigns to each alternative a level of significance of impact for each of the resource categories. The DEIS notes that these are the evaluations of the lead agency, the USCE, and that the "Charleston

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.



District does not concur with the significance attributed to some impacts." DEIS at V.7. Specifically, the Charleston District finds "some degradation" of water quality and "minor adverse impact" to fisheries, wildlife, and endangered species from normal refinery operation and that large spills are unlikely "but potentially very damaging" to water quality, fisheries, wildlife, and endangered species. DEIS Table V.1 at V.8. The expert cooperating agencies, EPA and USFWS, conclude that normal refinery operation and oil spills would have significant adverse impacts on water quality (DEIS at VII.B114) and fisheries and wildlife (DEIS at VII.C-57).

The analysis and conclusions of the cooperating expert agencies regarding the severity of environmental impacts of the various alternatives must be used by the lead agency USCE "to the maximum extent possible consistent with its responsibility as lead agency." 40 CFR 1501.6(a)(2). The EPA and USFWS are cooperating agencies based on their special expertise in air and water quality and fishery and wildlife resources. Rather than incorporating the extensive analysis and documentation of the expert agencies "to the maximum extent possible," the USCE notes that "divergent perspectives and environmental evaluations of these agencies would preclude full agreement by all agencies on the significance of all impacts." DEIS at V.7. The USCE then notes that the "Charleston District believed it desirable in the interest of public disclosure to show the basis for its evaluations (DEIS at V.7) and provides a half page "analysis" of the basis for its evaluations.

The USCE analysis of impacts on water quality, fisheries, wildlife, and endangered species does not incorporate the analyses of the expert agencies "to the maximum extent possible." Moreover, the USCE evaluations are arbitrary and without supporting documentation and analysis. It is not just "desirable in the interest of public disclosure" for the USCE to show the basis for its evaluations, it is required by law and is the heart of the NEPA process. 42 USC 4332; 40 CFR 1500.2(b), 1501.2, 1502.1, 1502.2(a). Inadequate documentation and analysis underlying the USCE evaluation of impacts of alternatives precludes effective public participation in the review process. The USCE should explain its "divergent perspectives" on water quality, fisheries, wildlife, and endangered species. The USCE must provide adequate documentation and analysis to support findings contrary to the expert agencies and to overcome the deference standard to the expert agencies. The conclusions of the USCE contained in the DEIS Table V.1 are arbitrary and capricious and violate both the letter and spirit of NEPA.

#### Endangered Species

The National Marine Fisheries Service has concluded, and the DEIS notes at page VII.C-48, that the operation of

the proposed refinery is likely to jeopardize the continued existence of the southern population of shortnose sturgeon. The USCE concludes that the proposed refinery would have a "minor adverse impact due to normal refinery operation" on endangered species and that large spills are "unlikely but potentially very damaging." DEIS at V.8.

The NMFS Biological Opinion on shortnose sturgeon is based on accurate and up-to-date information given the paucity of data on life history requirements and status of the shortnose sturgeon. Winyah Bay may provide the most important refuge for shortnose sturgeon in its southern distributional area. The Bay is especially favorable to sturgeon because of the availability of deep water, food, and relatively unaltered estuarine and associated riverine habitat. The status of shortnose sturgeon in Winyah Bay is poorly understood. No quantitative population estimates are available, but shortnose sturgeon are not known to move between river systems and, consequently, each river may have a unique population.

The NMFS jeopardy opinion is entitled to substantial deference. *National Wildlife Federation v. Coleman*, 529 F.2d 359 (5th Cir. 1976). Although the USCE has the ultimate authority to go forward in the face of the jeopardy opinion, that decision must be based on convincing evidence to rebut the NMFS opinion and the USCE must affirmatively seek the best information available to support a contrary opinion. *Roosevelt Campobello International Park Commission v. EPA*, 684 F.2d 1034 (1st Cir. 1982). The contrary opinion and supporting evidence of the USCE should have been published and integrated into the DEIS for public comment and review. 40 CFR 1502.25. Notwithstanding this failure, the USCE must develop evidence to show that the shortnose sturgeon will not be jeopardized even if the costs of developing the information are substantial. The bounds of best available evidence could best be described in the sense of capability of being acquired and should begin with a response to the NMFS request for additional information.

#### Additional Comments

In considering oil spill scenarios, low probabilities are given for catastrophic oil spills. It is important to note that two significant spills have occurred in a nearby area. In 1982 a 4000 barrel and in 1983 a 1000 barrel spill occurred within the Cape Fear River system near Wilmington, North Carolina. In both cases the responding agencies were unable to contain the spill and marsh vegetation along the river was heavily coated and subsequently killed or weakened. In addition, oil became incorporated into river sediments. It should be noted that due to its much more expansive marsh system and generally low water velocities the Winyah Bay system is much more sensitive to oil spills than the Cape Fear. It should also be noted that the existence of an oil

See the response to comment AF-2 regarding compliance with the Endangered Species Act.

The Corps believes the oil spill analysis in the DEIS is sufficient and this comment does not point to any specific deficiencies. Therefore, we do not believe it necessary to revise the DEIS by adding documentation of other spill events. See also the response to comment AV-16 regarding the effectiveness of oil spill clean-up efforts.

spill contingency plan does not in and of itself prevent the devastating effects of a major spill.

AY-5

Table V.1 on page V.8 states that with respect to permit denial, the "future base condition may change significantly due to other developments" in the specified resource categories. The table should specify that this may be, for example, a degradation of water quality from additional discharges or an improvement in water quality from additional treatment by existing dischargers. For consistency, the table should also note that the future socio-economic base of Georgetown County may change significantly in response to other developments such as an accelerated tourism industry.

AY-6

In conclusion, based on the documentation and analysis of the expert agencies, we believe the preferred alternative is permit denial. We agree with the USFWS assessment that "the Winyah Bay system is unique and irreplaceable," "its abundant resources are of national significance," and the "chosen site represents one of the worst possible sites in coastal South Carolina for an oil refinery." DEIS at VII.C-58. We also believe the DEIS has serious shortcomings as outlined above which unless addressed and corrected will extend the permitting process into the indefinite future and in all probability involve another branch of government. Winyah Bay is a national treasure of unquantifiable values. The ability to assimilate the chronic and potentially catastrophic effects of an unnecessary oil refinery is not one of those values.

Sincerely,

*Derb S. Carter, Jr.*  
Derb S. Carter, Jr.  
Director and Counsel

Table V.1 is a summary-type table, consequently, excessive detail would reduce its utility. The Corps therefore believes it unnecessary to specify that "changes" in water quality may include either degradation of water quality from additional discharges or an improvement from additional treatment of existing discharges. The table has been revised to show that the future base condition in the socio-economic resource category may change.

Comments noted.

*Debb Carter*



## NATIONAL WILDLIFE FEDERATION

1412 Sixteenth Street, N.W., Washington, D.C. 20036 202-797-6800

October 19, 1981

LTC Bernard E. Stalman  
District Engineer  
Charleston District  
Corps of Engineers  
P. O. Box 919  
Charleston, South Carolina 29402

Dear Colonel Stalman:

I enjoyed meeting you last week at the Georgetown, South Carolina, public hearing. Again I thank you for holding the hearing and for the opportunity to make a statement.

At the hearing you indicated that you would accept additional information for the record. In addition to what we have already submitted I would like for you to consider the following information and include it in the record.

A crucial issue in this permit matter concerns whether there is a need for this refinery. If there is no need for additional refinery capacity, then there is simply no way that the benefits of the proposed refinery outweigh its considerable environmental costs. You are required under Corps regulations to weigh the costs and benefits of proposed activities. You must also consider all relevant factors during this weighing process. Need is a clearly relevant factor.

To date, I do not believe that the need issue has been adequately addressed. For example, the latest environmental assessment does not deal with that issue.

We do not believe that there is a need for the proposed refinery for several reasons including:

- (1) The large amount of current excess refinery capacity in the U.S.,
- (2) Declining oil consumption in the U.S.,

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- (3) The small size of the refinery and the inherent lack of sophistication of small refineries, especially their inability to modify product mixes;
- (4) The great propensity of major oil companies to meet changing product needs by retrofitting large existing refineries;
- (5) The economies of scale associated with larger refineries; and
- (6) The end of federal incentives for small refineries.

Several of these reasons are discussed below:

The United States has a surplus of refining capacity. In 1978 refineries were operating at 90 percent of capacity and "[t]he conventional wisdom was that more refineries would have to be built soon." Oil Concerns Have Too Many Refineries, Yet Too Few Fit to Handle Heavier Crude, The Wall Street Journal, p. 56 (March 18, 1981). U. S. refineries, however, are currently operating at their lowest rates since 1935, approximately 68 percent of capacity. Oil & Gas Journal, Demand, Production, Imports All to Fall, p. 128 (January 26, 1981). As of January 1980, U.S. refineries had a total operable throughput capacity of about 18 MMBD (DOE, Trends in Refinery Capacity and Utilization, p. 1 (December 1980)), however, at the time of the Wall Street Journal article in March of this year, demand was only about 15 MMBD and domestic refining throughput is currently running about 13 MMBD. Oil Daily, Latest API Statistics (July 17, 1981).

Furthermore current Reagan Administration and industry projections are that demand for petroleum products will remain level through 1985 and decline thereafter. DOE, Securing America's Energy Future: The National Energy Policy Plan (July 1981) ("NEPP"); DOE, Energy Projections to the Year 2000, A Supplement to the National Energy Policy Plan (July 1981) ("NEPP, Energy Projections"); National Petroleum Council, Refinery Flexibility (December 1980). In the Reagan Administration's first report on energy, the National Energy Policy Plan (NEPP), DOE concluded that the dramatic rise in the average price of a barrel of crude oil from the January 1979 price of \$15 to the current price of \$37 has (NEPP, Energy Projections, p. 1-2):

affected U. S. energy considerations profoundly during 1980 and the first half of 1981, and also changed expectations of how the U. S. energy market will evolve through 1985 and beyond. . . . From 1979 to 1980, for example, high world oil prices contributed to an eight percent decline in U. S. oil consumption and a 20 percent decrease in net U. S. oil imports. During the first half of 1981, U. S. oil consumption appears to have decreased by an additional eight percent from the same period in 1980. (emphasis added)

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As a result, the Reagan Administration predicts that conservation will reduce total energy consumption by 16 percent by 1990 over earlier projections, and that the rapid increase in oil prices relative to other fuels will reduce oil consumption at an even greater rate. Id. at 1-5.

A National Petroleum Council study based on industry surveys conducted in 1979, and therefore somewhat more dated than the recent DOE projections noted above, nevertheless concluded that (p. 5):

[T]otal U. S. demand for refined petroleum products will be constant or slightly declining during the decade of the 1980's.

More recently, industry representatives have concurred with DOE's findings that additional crude distillation capacity will not be needed to meet U. S. demand throughout the remainder of this century. Letter of Donald E. Smiley, Vice-President, Exxon Corporation to the Honorable Charlie Rose, dated May 1, 1981 (attached) ("Exxon letter"); Letter of J. M. Seamans, Sr. Vice President, Texaco, U.S.A. to the Honorable Charlie Rose, dated April 24, 1981 (attached) ("Texaco letter"); letter of R. W. Baldwin, Gulf Refining and Marketing Company to the Honorable Charlie Rose, dated May 5, 1981 (attached) ("Gulf letter"); Letter of H. Laurance Fuller, Amoco Oil Company to the Honorable Charlie Rose, dated May 4, 1981 (attached) ("Amoco letter"). In addition, more than 400,000 bpd of existing refining capacity has closed to date this year (DOE, Refinery Shutdowns Announced in Trade Publications, attached) and one major planned refinery has decided to halt further plans citing surplus existing capacity and a "flat demand curve for Petroleum products through the year 2000" as its reason (Brunswick Energy Company press release, dated May 14, 1981, attached). In addition Amoco intends to mothball its 104,000 barrel per day Wood River, Illinois, refinery (Amoco letter). Another major planned East Coast refinery promoted by the Hampton Roads Energy Company is reported to have indicated that "its developers will have to rethink that project before proceeding with construction." Virginia Ledger-Star, Small Refiners Threatened by Drop in Gas Use, June 17, 1981 (attached). Obviously, based on this information, additional refining capacity will not be needed in the foreseeable future. Indeed, the National Petroleum Council's study, concluded that additional refining capacity is not required. Refinery Flexibility, p. 5.

Some argue that additional refinery capacity is needed for low sulfur fuel oil and unleaded gas. However, there is adequate refinery capacity for low sulfur fuel oils and unleaded gasoline. In June 1980, DOE issued a draft study of refinery capacity which concluded that higher prices could be expected to reduce demand for gasoline and that shortages of unleaded gasoline were unlikely beyond 1985. Refinery Policy Study--Summary of Analysis, p. 10 (draft June 10, 1980). Since the proposed refinery will probably not be built before 1985, it could not possibly satisfy any present

October 19, 1981

shortage, even if it could meet such needs which is unclear based on the application before you. The DOE study also predicted a "glut" in the market low sulfur fuel oils because of rising oil prices and the conversion from oil to coal and other alternative fuels.

Even if there is a need for increased sophistication in U. S. refinery capabilities to meet changing crude oil supplies and product needs as some claim,<sup>1/</sup> the consensus appears to be that ongoing and planned retrofitting by existing refineries will be adequate to meet projected future demand and that it does not make sense to build unnecessary additional distillation capacity to meet future demand. For example, the Department of Energy in a recent letter stated that DOE expects current refining capacity to shrink in response to reduced overall demand and further expects market forces to encourage existing refineries to invest in upgrading their downstream capability. Letter of James B. Edwards, Secretary of Energy, to the Honorable Charlie Rose, dated April 27, 1981 (attached). In addition, as the Texaco letter indicates:

Recently, many companies have committed substantial capital investment funds to increase their flexibility to run high-sulfur crudes. This flexibility has remained ahead of product demand and we are not aware of any instance of product shortages that have occurred as a result of the inability to process high-sulfur crudes.

\* \* \*

The cost of upgrading an existing plant is far less than the building of a completely new refinery at a time when there is no projected increase in total product demand.

\* \* \*

---

1/ The National Petroleum council concluded that (Refinery Flexibility, supra, at 5):

Existing crude oil distillation capacity will be adequate through 1990, but substantial additional downstream processing capacity will be needed. Because of the expected changes in the composition of product demand and petroleum supply, \* \* \* [i]t is estimated that between 1979 and 1990 \$5 billion to \$12 billion (1978 dollars) of investment in new downstream process facilities will be required to meet these cases.

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Historically, the industry has accommodated change in crude quality and product demand through the interaction of the market-place.

The Gulf letter concurred that "[t]here is little or no incentive to construct a complete new refinery, given the existing surplus of total refining capacity." The reason for this is that it is less costly to retrofit an existing plant than to build a new installation because support facilities, such as storage tanks, utilities, etc., are already in place (Gulf letter). Similarly, the Amoco letter concluded that:

Given the current cost of crude oil and products, retrofitting a refinery to process heavy sour crude to produce high value products, such as gasoline, makes good economic and business sense.

Accordingly, as all of these companies have indicated, major retrofitting projects are either completed, planned or under consideration to meet changing crude supplies and product demand. Therefore, the proposed refinery is not needed to meet future U. S. refinery needs. Such needs will be met by retrofitting existing larger refineries. (See Amoco letter, p. 3).

Finally, the extremely small size of this refinery works a tremendous disadvantage. First, President Reagan has announced an end to federal incentives that have, since 1978, contributed heavily to the construction of small and unsophisticated refineries. In addition, economies of scale generally make larger refineries more efficient. Furthermore, the smaller refineries are usually less sophisticated and thus are unable to meet changing product demands.

I believe that the "need" issue would best be addressed in an EIS for two reasons; thus, I renew our request for an EIS. First, NEPA requires full consideration of all reasonable alternatives, including the alternative of no action. 40 C.F.R. 1500.8(a)(4) (CEQ Guidelines in effect at the time of preparation of the Pittston EIS). Numerous courts have emphasized the importance of analyzing the no-action alternative, particularly as a means to assess the need for a project. In Sierra Club v. Forehlke, 534 F.2d 1289, 1293, note 15 (C.A. 1976), the court required an analysis of the alternatives to accomplishing the objectives of a proposed of the and the results of not accomplishing these objectives.

In Monroe County Conservation Council, Inc. v. Volpe, the court held that the EIS must examine the "feasibility and impact of the abandonment of the project." 472 F.2d 693, 698 (C.A. 2, 1972). In Natural Resources Defense Council v. Hughes, 437 F. Supp. 981, 990 (D.D.C. 1977), modified on other grounds, 454 F. Supp. 148 (1978),



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the district court held that the no-action alternative is the most significant alternative which must be considered in the impact statement because only an adequate explanation of the reasons for not rejecting a project can provide the project's "very raison d'être." In Smeltzer v. Adams, 8 ELR 2021, 20224 (N.D. Iowa 1978), the court relying upon NRDC v. Hughes, held that the "do-nothing" alternative [is] possibly the most significant alternative . . . . Logically, in order to explain adequately why no action is not the preferable alternative, an EIS, would necessarily establish why the project is needed. City of Romulus v. County of Wayne, 392 F. Supp. 578, 586 (E.D. Mich. 1975); Libby Rod & Gun Club v. Potest, 457 F. Supp. 1177, 1187 (D. Mont. 1978), affirmed in part, reversed on other grounds, 594 F.2d 742 (C.A. 9, 1979).

Second, NEPA requires federal agencies to describe both environmental impacts and the "net economic, technical and other benefits of proposed action." 40 C.F.R. 1500.2. A balance must thereafter be struck between the national benefits and the environmental costs of the project. Calvert Cliffs' Coordinating Committee, Inc. v. AEC, 449 F.2d 1109, 1115 (C.A. D.C. 1971). Both sides of the benefits/costs equation must be fully set forth in the impact statement. In other words, the agency must not only describe the environmental impacts of the proposed project and discuss alternatives which might mitigate or avoid some of these environmental costs, but it must also accurately discuss the national benefits which are expected to be derived from the project. If there is not a substantial national need for the project, and if the project will result in adverse environmental impacts, there will not be a net national benefit from the project and approval therefore would be arbitrary and capricious. See Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, 435 U.S. 519, 549 (1978) (agency decisions may be set aside for substantial procedural or substantive reasons).

Thus, NEPA provides you with a powerful tool to closely examine the need for this project, to compare this need to the adverse environmental impacts of the project, and to consider the abandonment alternative if there is truly no need.

Even if you decide to forego these obvious benefits of preparing an EIS, you must still consider the no action alternative under your regulations and Section 102(2)(E) of NEPA and weigh the costs and benefits of the proposal especially its "need under your regulations."

LTC Bernard E. Stalman

- 7 -

October 19, 1981

Thank you for considering these comments.

Sincerely,

*Thomas G. Tomaszello*

THOMAS G. TOMASZELLO  
Counsel  
Resources Conservation  
Department

cc: Ray L. Derrick, President SCWF  
Dr. Jacqueline E. Jacobs, Executive Director, SCWF  
Charles Shaw, Regional Executive, NWF  
Debb Carter, Director, CWF, NWF  
Eugene C. Brickemeir, Jr., Esquire



# National Audubon Society

SOUTHEAST REGIONAL OFFICE  
POST OFFICE BOX 1286 CHARLESTON, S.C. 29402 (803) 723-6171

June 1, 1984

Mr. John L. Carothers  
U.S. Army Corps of Engineers  
Charleston District  
P. O. Box 919  
Charleston, SC 29402

Dear Mr. Carothers:

The National Audubon Society has several comments on the DEIS for the Georgetown refinery. We have discussed at length the statement with Betty Spence of the South Carolina Wildlife Federation. The bulk of our concerns are outlined in the Federation's comment letter of May 24th. We heartily endorse those comments and hope the specific points contained therein will be addressed in the FEIS.

Comments noted.

One point we would like to reiterate. A number of sections in the DEIS must cover areas which are directly dependent on details of specific refinery design and operation. Those details should be provided by the applicant before any permit is granted. Failure to provide such information should weigh heavily against the applicant.

See the response to comment AL-2 regarding the Corps' requirement for information from permit applicants.

The DEIS confirms the potential for irrevocable damage to Winyah Bay ecosystem. Damage not only from low probability major oil spills but from legal chronic discharges of pollution into the air and water. Consequently, we hope the permit will be denied.

Comments noted.

Sincerely,

*Terrence C. Larimer*

Terrence C. Larimer  
Regional Representative

TCL:ph

AMERICANS COMMITTED TO CONSERVATION  
Alabama   Florida   Georgia   Mississippi   North Carolina   South Carolina

**Ford, Bacon & Davis**  
Incorporated  
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John G. Whitcomb  
Vice President

Direct Dial  
(214) 238-6510

April 24, 1984

Carolina Refining & Distributing Co.  
6-B Booker Creek  
Chapel Hill, North Carolina 27514

Attention: Mr. N. R. Dorrance, President

Reference: Revised Environmental Assessment (4/30/81)  
Environmental Impact Statement (4/19/84)  
Federal Register, Vol. 49, No. 7 (1/11/84)

Subject: Georgetown Refinery Review of Draft EIS  
FB&D Proposal No. P-1706

Gentlemen:

Pursuant to your request, we have reviewed the subject documents and a summary of our findings follows.

I. History of Document Development

An Environmental Assessment (EA) was prepared by the U.S. Army Corps of Engineers and had as its subject the proposed pipeline crossing of the Sammit River by two 12" lines and the construction of a 30,000 BPSD petroleum refinery. The purpose of the pipelines is to off-load crude oil at the South Carolina Ports Authority pier serving the Carolina Refining and Distributing Company's Georgetown Refinery site. The EA incorporated a "worst case oil spill analysis" and concluded with a Finding Of No Significant Impact (FONSI). The EA was issued dated April 30, 1981.

A full Environmental Impact Statement (EIS) was undertaken and issued dated April 1984. The finding of the Corps of Army Engineers remain about as was stated in the EA.

II. Overview of Environmental Assessment

The Environmental Assessment contained a project description, a review of the environmental setting without the project, and a review of the environmental impacts of the proposed action. This last item included a review of the hazards of raw material and final products, a "worst case" oil spill analysis, and a summary statement as to assessment findings.

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The summary conclusion was as follows:

Based on the information contained in this assessment, as prepared pursuant to Corps of Engineers NEPA Implementation regulations contained in 33 CFR 230, and from a thorough review of available studies, I have concluded that the proposed project does not constitute a major Federal action significantly affecting the quality of the human environment and therefore, the preparation of an Environmental Impact Statement (EIS) provided for under Section 102(C) of the National Environmental Policy Act of 1969 is not required.

III. Overview of Environmental Impact Statement

The EIS considered the Purpose-and Need for the Proposal, Alternatives, a Review of the Affected Environment, Environmental Consequences, Environmental Consequences on Fish and Wildlife Resources, a List of Preparers, a Summary of Public Involvement, and Appendices.

The Abstract for this document reads as follows:

Carolina Refining and Distributing Company has applied for a permit to install two underwater pipelines across the Sampit River to transport crude oil and refinery products between the S.C. State Ports Authority pier and a proposed new oil refinery. This proposed refinery would enlarge the economic base of Georgetown County, one of the most economically depressed counties in South Carolina. The operation of the proposed refinery would further degrade air and water quality and aquatic resources in an area stressed to an undetermined extent by existing pollution. These adverse impacts caused by air emissions and liquid effluents can be avoided or their severity reduced by the use of better treatment methods now available. Winyah Bay is surrounded by marshes and other natural areas, much of which are maintained in the public trust by State agencies and institutions and are considered to be of unusual value. Large oil spills are very unlikely but could cause extensive long-term damage to these areas. However, the spill prevention control and countermeasure plan and the operations manual required by existing law provide measures to prevent and control oil spills.

#### IV. Proposed Rule for Implementing the National Environmental Policy Act

In view of the conclusions of the EA and a proposed rule for implementing the National Environmental Policy Act (NEPA), it is difficult to understand why the EIS was undertaken at all. Reference is made to the Federal Register, Vol. 49, No. 7, 33 CFR Part 230, dated January 11, 1984. According to Appendix B, Section 6, Part 2, utility line crossings which completely span the waterway, and do not interfere with commercial or recreational navigation, and do not change pre-construction bottom contours due to excavation and filling, are categorically excluded from NEPA documentation. Further, according to Appendix B, Section 7, the EA should normally conclude with a FONSI or a determination that an EIS is required. In view of the fact that the EA concluded with a FONSI, it is reasonable to inquire why the EIS was developed.

The reasons for developing this EIS are given in Section 9 of the EIS, entitled "Public Involvement." The EIS was developed because approximately twenty letters were received from agencies, groups, and individuals who felt that certain questions pertaining to potential oil spills had not been addressed in the preliminary EA or in the revised EA which was distributed May 4, 1981. This decision also involved the Army Corps asking the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S. Coast Guard to serve as cooperating agencies in the preparation of the EIS. The time and location of a scoping meeting was defined at which approximately fifty people were in attendance. A public meeting was held December 8, 1983 in Georgetown, to inform the public of the procedures adopted for preparing the EIS and to receive comments on the scope and extent of these procedures. Another public meeting was projected to receive comments on the draft EIS. The comments of the undersigned reviewers on the draft EIS follow in the next section.

#### V. Comments on Draft EIS - Summary Statement

1. The Charleston District of the U.S. Army Corps of Engineers has asked the U.S. Fish and Wildlife Service (FWS), the U.S. Environmental Protection Agency (EPA), and the National Marine Fisheries Service (NMFS) to serve as cooperating agencies in the preparation of the EIS. Subsequently, the U.S. Geological Survey was asked to prepare an evaluation of the effects of potential oil spills on ground water resources. The participation of the EPA, FWS and the USGS has enabled the district to bring to bear at the beginning of the EIS process a much wider base of expertise than is normal. The resultant draft EIS is therefore more thorough

and has incorporated a broader perspective than would be possible with a single agency. The divergent perspective and environmental evaluations of all these participating agencies precludes full agreement on the magnitude of all impacts. The responsibility for the EIS and the decision on the permit application rests with the Corps of Engineers.

2. The summary notes that the proposed refinery would enlarge the economic base of Georgetown County, which is one of the most economically depressed counties in South Carolina.

3. Under adverse environmental impacts, the EIS has made a number of observations which we review as follows:

a. Air Quality (by the EPA)

The EIS analysis indicates there could be violations to air quality standards for the non-methane hydrocarbon and ozone, and that there is the possibility that the proposed refinery could consume all of the remaining 24-hour SO<sub>2</sub> increment in both the Georgetown Class 2 Area and Class 1 Area of Cape Romain. Reference to the EIS Table of Pollutants clearly indicates that emissions from the proposed facility are substantially within the air quality standard. However, there are eleven other sources within the Georgetown area listed in the DHEC's (Department of Health and Environmental Control) emissions inventory. A table has been developed comparing the Carolina Refining and Distributing Company's (CRDC) emissions to the existing sources. The analysis concludes that unavoidable, adverse air quality impacts would result when the CRDC emissions are combined with existing sources. This potential requires some closer analyses which may be had by comparing specific pollutants:

Pollutant	Existing Sources		CRDC Refinery	
	Total Emissions (Tons Per Year)		Est. Emissions (Tons Per Year)	
Suspended Particulates	1,675		100	
Sulfur Dioxide	51,646		50	
Carbon Monoxide	1,528		100	
Nitrogen Dioxide	19,694		454	
Hydrocarbons	526		2,080	

The only significant data in the above tabulation is that for hydrocarbons. However, it should be noted that the estimated emission of 2,080 tons/year of hydrocarbons from

The information provided by the applicant through his consultants has been used except where modified by EPA to comply with the requirements of recent regulations. The Corps acknowledges that the analysis in the DEIS may be conservative in some respects. All information will be evaluated by the South Atlantic Division Engineer in making his decision on the permit application.

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the CRDC refinery is based upon an Engineer's Report presenting potential emissions from Uncontrolled sources. These sources included process drains, pump seals, compressors, valves, separators, cooling towers, and miscellaneous minor sources. It is neither the intent of CRDC nor that of this Engineer that these sources should be uncontrolled. As the EIS Summary Statement notes, a number of mitigating procedures are available to substantially reduce these impacts.

With reference to sulfur dioxide emissions, recent technical developments virtually eliminate SO<sub>2</sub> emission from the Claus/Tail Gas Treating System. This technological elimination of SO<sub>2</sub> emissions from the Claus/Tail Gas Treating facilities has the impact of reducing total refinery SO<sub>2</sub> emissions by about 50 percent.

b. Water Quality (by the EPA)

The major pollutants identified here are ammonia discharge, oil and grease discharges, and accidental oil spills. According to the Summary Statement, the CRDC facility could add about 93 kg/day of ammonia to a present discharge by other industries of 94 kg/day, or an increase of almost 100 percent. However, it further notes that ammonia is readily oxidized in the water and that very little dissolved oxygen level reduction would be imposed according to modeling results.

CRDC waste waters are expected to add 50 kg/day of oil and grease to a present industrial discharge of about 539 kg/day, or a 9.3 percent increase. However, this potential impact is based upon provision by the CRDC Engineer of data which is typical for a refinery. It is, in fact, non-optimum data in itself, and does not consider inclusion of a designed effluent treatment.

With reference to oil spills, the EIS projects an annual crude oil spill volume of 4.2 barrels and 15.4 barrels for barges and ships, respectively. However, this projection is based on statistical data derived over a period of less stringent regulation and less overall care in the handling of ship-to-shore transfers. Further, this experience is with much busier ports and with ports which have to some extent obsolescent facilities. It therefore represents what we could describe as a worst case based on outdated technology and procedures. In fact, as the EIS states, conditions of hypothetical oil spill scenarios have not been chosen randomly but such that the consequences of the spill will be the most pronounced in keeping with the spirit of a worst case analysis.



Mr. N. R. Dorrance  
Review of Draft EIS  
April 24, 1984  
Page 6

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It should be noted that the twenty letters that prompted decision to initiate the EIS were based on concern for catastrophic oil spills and clearly demonstrate that there is general agreement of agencies and public with the conclusion of the report that the Sarnpit Crossing and the CRDC Refinery impose no significant threat per se.

VI. Conclusion

BA-2 The draft EIS for the subject CRDC Refinery indicates remarkably little additional impact on the environment of the Georgetown area. Further, this conclusion is based upon estimated emissions and not engineered values; and, as it is pointed out above, some of these are known to be high estimates. The EIS has confirmed, with great detail, the conclusion of the original Environmental Assessment that the proposed project does not constitute a major Federal action significantly affecting the quality of the human environment.

Comments noted.

Sincerely,

FORD, BACON & DAVIS, INCORPORATED  
Texas Division

*John G. Cathcart*  
John G. Cathcart  
Vice President

/cgt

# Ford, Bacon & Davis

Incorporated  
Engineers - Constructors  
TEXAS DIVISION



May 15, 1984

U.S. Army Corps of Engineers  
P. O. Box 919  
Charleston, South Carolina 29402

Attention: Mr. John Carothers

Reference: Carolina Refining & Distributing Co.  
Georgetown Refinery Project  
FB&D Proposal No. P-1706

Dear Mr. Carothers:

John Cathcart has told me of the questions which have arisen as a result of the public hearing on the EIS for Carolina Refining's Georgetown refinery. He has asked me to respond.

BB-1

B-160

Mr. Cathcart's letter of April 24, 1984 to Carolina Refining and Distributing Company (re: Review of Draft EIS), which is now a part of the public record, states in its Section V, paragraph 3, subparagraph a, that

1. "... the estimated emissions of 2,080 tons/year of hydrocarbons ... is based upon an Engineer's Report presenting potential emissions from uncontrolled sources ... [and] ... a number of mitigating procedures are available to substantially reduce these impacts."

and that

2. "... recent technical developments virtually eliminate SO<sub>2</sub> emission from the Claus/Tail Gas Treating System."

Further comments on each of these points follow, taking the SO<sub>2</sub> issue first.

A major source of SO<sub>2</sub> emissions from petroleum refineries is the Claus sulfur recovery unit and its tail gas treating system. Refinery cracking and hydrotreating processes convert sulfur, which is chemically bound in the crude oil feed, to hydrogen sulfide gas. The hydrogen sulfide gas appears in a background of hydrogen and hydrocarbon gases which are valuable as process gases or as fuel for the refinery. Before the gases can be used, the hydrogen sulfide must be removed; this removal is required to prevent SO<sub>2</sub> pollution and to protect sensitive catalysts from sulfur poisoning.

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2201 North Central Expressway · Richardson, Texas 75080

See the response to comment BA-1 regarding the analysis of potential air emissions.

Hydrogen sulfide ( $H_2S$ ) is conventionally removed from the background gas by absorbing it in a water solution of an alkanolamine compound from which it can be stripped to produce an "acid gas" containing  $H_2S$  and  $CO_2$ , which is also absorbed. It is this "sweetening" step which allows refinery fuel gases to meet the 20 ppm  $H_2S$  specification required.

Acid gas is then processed in a Claus sulfur recovery unit (SRU). The SRU converts  $H_2S$  to elemental sulfur at efficiency levels in the range of 95% to 97%. Refinery SRU's producing more than 20 long tons per day of sulfur are restricted to emissions of less than 10 ppm  $H_2S$  and 250 ppm  $SO_2$ . The conventional way to meet this requirement is by treating the SRU tail gas--that is the effluent from the SRU--and incinerating the treated tail gas so that residual sulfur values are all converted to  $SO_2$ .

The most common tail gas treatment is one which involves reacting the SRU tail gas with hydrogen to convert sulfur values to  $H_2S$ ; and following this hydrogenation with absorption in an alkanolamine solvent solution to separate and concentrate  $H_2S$  which is then returned to the SRU. Processes which can reduce the  $H_2S$  content in the treated tail gas to about 150 ppm are presently considered BACT. The resulting  $SO_2$  concentration of incinerated treated tail gas is below 250 ppm.

A major technological breakthrough in tail gas treating--the SULFTEN<sup>SM</sup> System--has recently been announced by Ford, Bacon and Davis, Incorporated and Union Carbide Corporation. The SULFTEN System is similar in principal to the process described above, with two major differences: the SULFTEN System applies advanced reactor technology to maximize the conversion of other reduced sulfur compounds--COS and  $CS_2$ --to  $H_2S$ , and it applies advanced solvent technology and contacting techniques to reduce  $H_2S$  in the treated tail gas to less than 10 ppm so that the treated gas can be discharged directly to the atmosphere. The net emissions are reduced by about an order of magnitude to negligible quantities, and the need for incineration is eliminated, therefore significantly reducing operating costs. Capital and operating costs for the SULFTEN System are comparable to other tail gas treating processes.

The technologies applied to the SULFTEN System have proven their reliability through extensive experience. A commercial scale test unit has been operated on the SULFTEN solvent for over a year with virtually no interruption due to operating difficulties within the SULFTEN System, and 97% on-stream time does not seem an unrealistic expectation. The first commercial unit--a retrofit to an existing tail gas treating unit--is now under contract. Neither facility is permitted for  $H_2S$  emissions; such a permit will be applied for in Texas very shortly.

Reactive hydrocarbon and organic materials (Volatile Organic Compounds or VOC) can be emitted in the petroleum refinery from a variety of sources which include the following:

- Process drains, points at which process fluids can be drained from process equipment into a process sewer.
- Pump seals, where the rotating shaft enters the pump casing.
- Compressor seals at the point where reciprocating or rotating shafts enter casings.
- Valves which can leak around valve stem packings and through the valve seat of vent or drain valves.
- Safety valves which are subject to seat leakage.
- Oil/water separators to which water from process systems is drained and where wash down and oily runoff are handled.
- Cooling towers if there is leakage from process systems into the cooling water system.
- Storage tanks for crude oil and for volatile products from which vapors can be displaced by filling operations and by breathing.
- Miscellaneous sources.

A variety of mitigative equipment, designs, practices, and procedures may be applied to these sources.

For example, tanks for volatile materials including crude oil and gasoline are typically equipped with floating roofs which serve to eliminate displacement and breathing as sources of emissions and substitute the leakage of the roof seal, a ten-to-twenty-fold reduction in emissions; the use of floating roof tanks for these services at the CRCO refinery is intended. Other mitigative methods applicable to tanks include connecting tank vapor spaces to closed exhaust systems which collect vapors and recover hydrocarbons or which route tank vapor to the refinery flare where they are burned.

Equipment specified to mitigate VOC emissions will include double mechanical seals on selected pumps, and compressor rod housings which are closed and can be connected to closed disposal systems will be used on machines which are compressing reactive hydrocarbons. Selectivity in the use of double seals is appropriate because many refinery pumps do not handle volatile fractions.

U.S. Army Corps of Engrs.  
Carolina Refining - P-1706  
May 15, 1984  
Page 4

Ford, Bacon & Davis  
Inc.

Mitigative techniques which are effected during the design of the refinery facilities are the use of closed process drain systems and of covered oil/water separators with appropriate vapor recovery or vapor incineration systems. Careful design also permits the minimization of vent and drain points. The use of covered separators will result in emissions reductions on the order of 95% relative to open separators.

The refinery will also apply administrative methods to mitigate VOC emissions. Such methods include personnel training in the importance of leak prevention and detection, the designation of persons to whom leaks should be reported, and methods and procedures for recognizing leaks and for taking leaking equipment out of service. Many sources of VOC emissions, e.g., valve packing, are not readily detectable by visual means, and the refinery will implement a program of periodic testing for leaks with appropriate hydrocarbon leak detection instruments. Leaking equipment so detected will be repaired as soon as practicable. It is estimated that a leakage monitoring and maintenance program can reduce valve leakage as a source of emissions by a factor of about 0.7.

It is hoped that the above discussion answers your questions on the two points covered. If there are further questions, please do not hesitate to bring them to us.

Enclosed is a copy of a paper on the SULFTEN System recently given to the NPRA Annual Meeting.

Sincerely,

FORD, BACON & DAVIS, INCORPORATED  
Texas Division

  
G. W. Taggart  
Manager of Technology & Licenses

/cgt

Enclosure

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THE SULFUR<sup>®</sup> SYSTEM  
A NEW CLAUS TAIL GAS TREATING PROCESS

by  
George W. Taggart  
John H. Dibble

One of the concepts which was explicit in the view of the authors of the environmental regulations was that of "technology forcing"--that is, of writing laws which were stringent enough to elicit technological development. This objective has been realized in all areas of air and water pollution control.

The converse is also occurring--that is, when technological breakthroughs occur, they may become "regulation forcing." Only recently, EPA reviewed NSPS for refineries and declined to modify them, but the pressures of acid rain and the technological attainability of lower levels of pollutants will surely combine to produce lower and lower values of allowable levels, a precedent already set in California.

In acid gas treating, the response to technology-forcing regulations and stringent permitting requirements has evolved in several stages.

- First, Claus units were improved to recovery levels of about 97 percent by more careful design, additional reaction stages, and better control and operation.
- Then new methods of extending the Claus reactions increased recoveries to about 99 percent.
- These were followed by processes in which tail gas was reacted and subsequently treated, and these processes raised recovery levels to 99.9 percent or more.

These reaction-treating processes were aimed at meeting the NSPS requirement to limit discharges of  $\text{SO}_2$  to 250 ppm. They typically produce a residue gas containing reduced sulfur compounds ( $\text{H}_2\text{S}$ ,  $\text{COS}$ ,  $\text{CS}_2$ ) which is then incinerated to convert the sulfur values to  $\text{SO}_2$ .

The SULFTEN System is a new process in the reaction-absorption category which is aimed at meeting the MSPS stricture on the direct discharge of  $H_2S$ , the requirement that concentrations be less than 10 ppm. The advantages of a process which will meet that condition are obvious--net reduction in total sulfur discharges, the elimination of the thermal pollution of incineration, and the significant operating cost savings resulting from not incinerating. In addition, there is the potential for reduction or even elimination of the sizable capital investment which the residue gas incinerator represents.

With these advantages in mind, Union Carbide Corporation (UCC) and Ford, Bacon & Davis, Incorporated (FBD) agreed to work together to search for ways to improve on Claus tail gas treatment processes. The result of this collaboration--the SULFTEN System--will reduce the  $H_2S$  content of residue gas to less than 10 ppm and provide the lowest concentration of total reduced sulfur of any process offered for tail gas treating.

The improvements responsible for the unique features of the SULFTEN System can be classified into absorption, reaction, and process design. Chronologically, the solvent formulation discovery by UCC provided a basis for enhanced  $H_2S$  absorption and initiated the development of the SULFTEN System. This breakthrough in solvent formulation provided the impetus to fine tune all aspects of the system to assure minimal total sulfur values. This has been addressed in the design and selection of the reactor components. Finally, to make the SULFTEN System simple and nearly trouble free to operate, FBD and UCC have drawn on their years of experience and eliminated most of the control problems found in other tail gas treating units.

The SULFTEN Unit (Figure 1) consists of a heater to bring Claus tail gas up to reaction temperature; a hydrolysis reactor designed specifically to promote the reactions





a hydrogenation reactor designed to promote the reactions



and coolers to reduce the temperature and remove diluent from the process gases. The cooled gases are contacted with SULFTEK solution to absorb  $\text{H}_2\text{S}$  while rejecting most of the  $\text{CO}_2$ . The SULFTEK solution is then stripped to produce an acid gas which is returned to the Claus unit feed.

It is instructive to review the individual process steps in somewhat greater detail and to consider options which can be exercised in particular applications.

#### Heating (Figure 2)

The reaction feed heating accomplishes two important functions--it raises the temperature of the reacting gases to that at which the reactions can proceed at reasonable rates, and it assures that any residual free sulfur in the tail gas exists only in the vapor phase, ensuring that sulfur liquid will not impinge on and poison the catalysts. The desired temperature is in the range of 530°F to 630°F, with the design temperature for a given application determined from the particular conditions. Heating of tail gases for reactor feeds has been successfully accomplished in all the conventional ways: indirectly using a heat medium, with steam, by electrical heating, or by exchange with reactor effluent; directly using combustion products mixed with the tail gas; and directly with partial oxidation of fuel to produce a reducing gas.

There are cogent engineering arguments which can be marshalled in favor of both direct and indirect heating, with the reducing gas production option being dictated by the availability of an alternative reducing gas. Economics must be worked out for the individual case and must consider the value of heat recovered as 50 psig steam, the cost of pressure drop in exchangers, and the cost of natural gas which would usually be recommended over a refinery fuel gas for direct heating.

Reactors (Figure 3)

The SULPTEN reactors can best be considered as a reaction system. They reflect the evolution of catalyst technology over the past several years and the development of highly active and reaction specific catalysts. Careful selection and integration of the reactor components ensures the proper system control necessary for stable, trouble free operation, particularly as it affects the downstream absorption-desorption section. Poor reactor control can result in excessive corrosion, inefficiency, heat stable salts formation in the absorbent solution, amine oxidation degradation, foaming, high solvent losses, and off-spec treated gas.

The recommended scheme involves the use of molecular hydrogen from an external source introduced into the system between the reaction stages. The hydrogenation reaction can use CO as a reducing agent since, typically, hydrogenation catalysts also promote the water gas shift reaction



However, the catalyst also promotes the analogous "sour gas shift"



effectively reversing a portion of the work previously done in the hydrolysis reaction zone.

Clearly, a CO based reducing gas works; it is also possible to add reducing gas upstream of the first reaction zone and this, indeed, is the situation when a reducing gas generator is used in the SULPTEN System.

It is clear that both catalyst beds can be located in the same vessel, and that they can be contiguous. The preference is that they be separated so that each can be monitored individually, the use of a single vessel is primarily an economic and plot arrangement consideration. It is also conceivable that some intermediate cooling could be required, but this is a highly unlikely instance.

#### Cooling

Reaction products must be cooled to a temperature of about 100°F in order for the absorption to proceed efficiently. This cooling step usually includes at least a heat exchanger, typically a waste heat boiler, and a contact cooling stage in which the hot process gas is cooled by contact with circulating water.

The boiler can recover essentially all of the heat put into the system at the feed heater and conveniently transfer that heat to the stripper reboiler. If the refinery steam balance discourages the recovery of heat as steam, a feed-effluent exchanger can be used.

In principal, the contact cooling system can be replaced by a conventional exchanger; there is a penalty in that the contacting, in addition to cooling, also washes the gas and removes both particulates and chemical impurities which may be present. This washing operation contributes to the fact that the SULFTEN absorber evidences little tendency to foam.

#### Absorption (Figure 4)

The absorption-desorption section employs gas-liquid contacting and is similar to a conventional amine system. Specific aspects of design and arrangement utilize the full advantages of the proprietary solvent and reduce many of the operating problems associated with other amine systems. The SULFTEN System is specifically designed for good absorption at about 100°F to ensure on-spec performance. Insensitivity of the absorption to upstream Claus fluctuations enhances the stability and reliability of the SULFTEN System.

The balance of the unit includes the usual heat exchange, stripping, and reboiler equipment.

#### The Absorption Solution

The absorption medium consists of a specially formulated, proprietary, MEZA-based solvent. MEZA, as it is ordinarily applied, shows many attractive characteristics: it tends to be selective of  $H_2S$  over  $CO_2$ , concentrating  $H_2S$  with resulting enhancement of Claus operation; it has a relatively low heat of reaction so it is quite easy to strip; and it exhibits high stability and low corrosivity in relation to DEA or MEA. The limitation of MEZA, as with other chemical solvents for  $H_2S$ , has to do with its relative ineffectiveness at low partial pressure of  $H_2S$ , a condition usually associated with low total system pressure.

Careful study of absorption characteristics of MEZA has produced a unique formulation which can effectively absorb  $H_2S$  at partial pressures which are vanishingly small, and this without sacrifice of its ability to discriminate against  $CO_2$ , and without noticeable effect on capacity, ease of stripping, corrosion, chemical or thermal stability, foaming, and compatibility with materials of construction. The solvent is maintained and monitored in a fashion similar to other amine solvents and a complete evaluation of solvent condition is available through UCC.

#### General Considerations

A major capital investment, and one of the major operating costs in a sulfur recovery facility, is associated with compression of combustion air for the sulfur recovery unit. The considerable costs involved put a premium on equipment pressure drop. There is emphasis in designing SULPTEN Units on keeping pressure losses at a minimum. Two options are available for providing the required driving force--providing it at the Claus unit feed, or furnishing an additional blower within the SULPTEN System. In new facilities, the former represents the lowest overall cost; in the case of the addition of a SULPTEN System to an existing Claus facility or the handling of multiple Claus unit tail gases, a blower in the SULPTEN System may be more attractive.

MEA and DEA units in general sweetening service frequently benefit by the carbon filtration of the circulating solution. In the SULPTEN System, slip stream filtration using cartridge filters is recommended. The use of corrosion inhibitors is not indicated for the SULPTEN System.

#### Metallurgy

None of the SULPTEN System is subject to any particularly severe corrosion and, as noted above, the use of an inhibitor in the solution is not indicated. In general, the entire system is recommended to be of carbon steel construction except in a few areas where 18-8 stainless steel is recommended. Such areas include, for example, pump wear parts, pump impellers in some services, trays, and reboiler tubes. Stress relieving of steel is recommended in solution service.

#### Performance

The name of the game in pollution control is performance, and better performance can be directly reflected in such parameters as total discharge, cost of offsets to allow facilities expansion or upgrading, or the value of banked emissions credits.

More directly, performance can be characterized by the quality of residue gas from the System. In the most concise terms, SULPTEN System residue gas will contain negligible quantities of  $SO_2$  and will meet NSPS for both total reduced sulfur and  $H_2S$  discharges to the atmosphere. The reliability of systems of this type is well proven. On-stream time for the SULPTEN System will be significantly better than for the Claus units furnishing its feed, and should readily exceed 95 percent.

Operability, again, has been clearly proven in similar units and is better than might be expected from other refinery reaction and absorption systems by virtue of low pressure and mild temperatures in the reactions and the absence of corrosion impurities and foam producers in the absorption-regeneration system.

#### Experience

The one unit on line at this time is a retrofit unit incorporating a SULFTEN absorption-desorption system. The unit, located at a mid-western refinery, has been on stream for nearly a year at this writing. Performance can be described as in every way up to the expected standard.  $H_2S$  concentration in residue gas consistently is below 10 ppm and has been observed to operate below 1 ppm for extended periods; foaming occurred in the early days of operation but is now a rare experience; corrosion is such that the use of plate and frame exchangers has been trouble free and the steel tubes in the reboiler have not been subject to detectable corrosion to date.

#### Economics

The economic base line for tail gas treaters over the years has been clearly defined by two competing processes--one involving reaction to  $H_2S$  and absorption, the other using reaction to  $H_2S$  followed by reaction in solution. In terms of capital investment, these have been in nearly a stand-off position with the choice frequently made on a basis of utilities and chemicals costs.

The SULFTEN System facility involves a capital expenditure of about 80 percent of that for a base line unit of comparable feed capacity; utilities (steam) cost for the SULFTEN System will be less than 75 percent of those associated with the base line unit. Overall economic factors are impacted by the performance of the SULFTEN System in that the costs of incinerator operation (Figure 5) can be eliminated, and incinerator construction costs (Figure 6) can be eliminated or significantly reduced.

Where tail gas treating units incorporating reaction to  $H_2S$  already exist, most of the operating cost benefits of the SULFTEN System can be realized by the modification of only the portion of the existing system downstream of the reaction section to include the SULFTEN System absorption-desorption section. Such a retrofit to an existing tail gas treating unit can frequently be made at minimum cost by reusing portions of the existing equipment, and with careful scheduling can be done with minimum down time.

Conclusion

The SULFREN System offers a unique combination of advantages:

- Lowest emissions levels
- Low first cost
- Low operating costs
- Low chemicals costs
- No incineration required
- Ease of operation
- High on-stream factor

In short, the SULFREN System is a nearly ideal answer to the problems of Cost and Compliance.

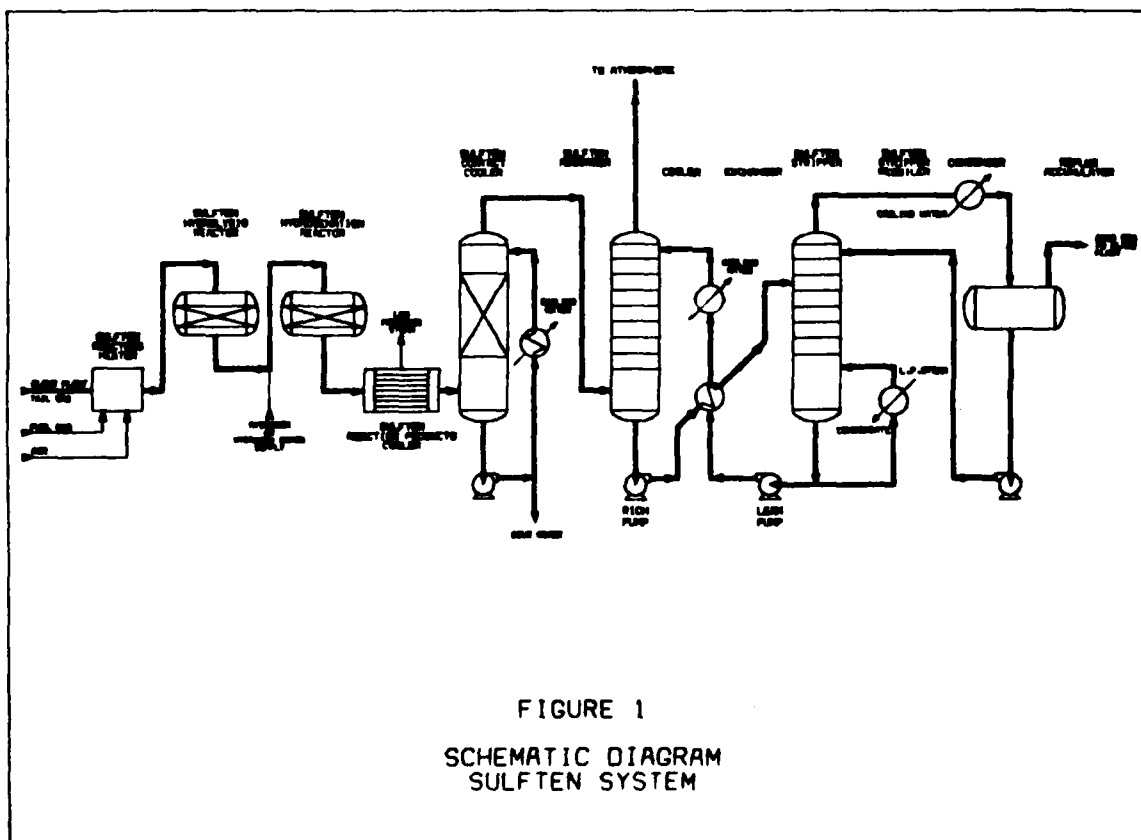


FIGURE 1  
SCHEMATIC DIAGRAM  
SULFTEN SYSTEM



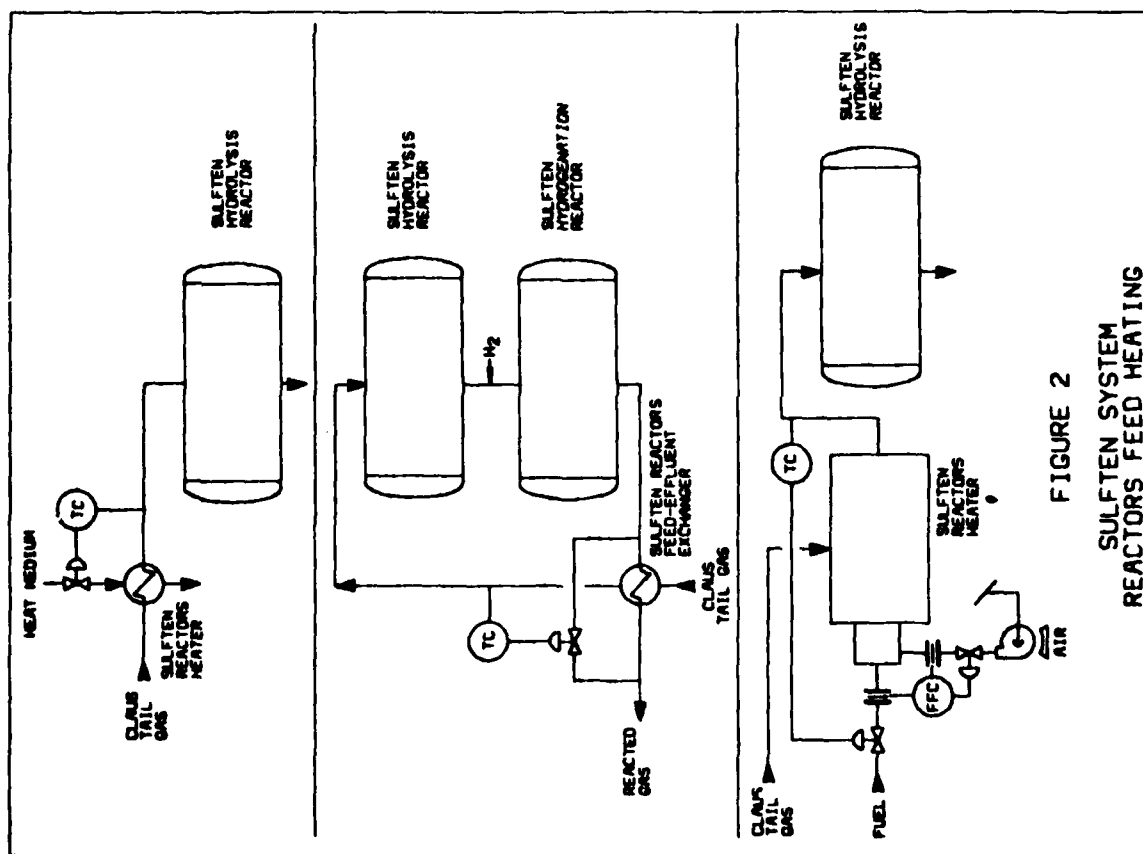


FIGURE 2  
SULFTEN SYSTEM  
REACTORS FEED HEATING

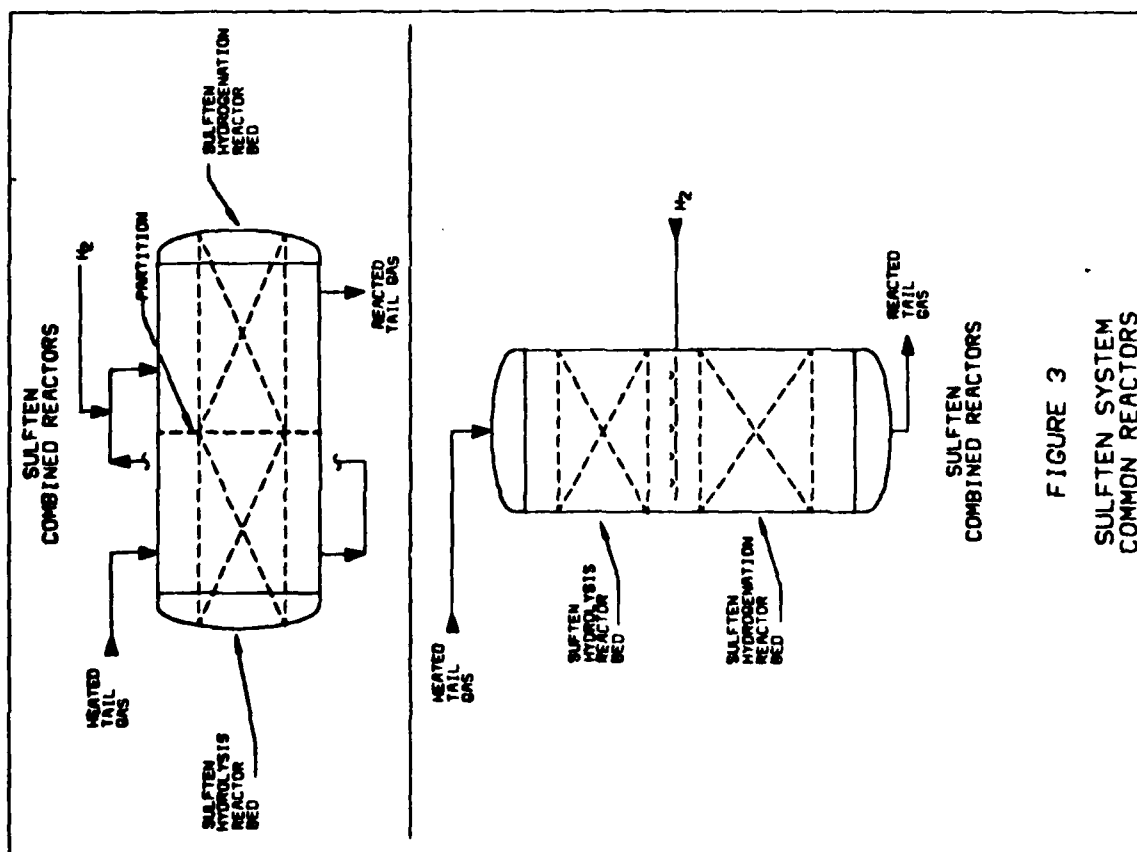
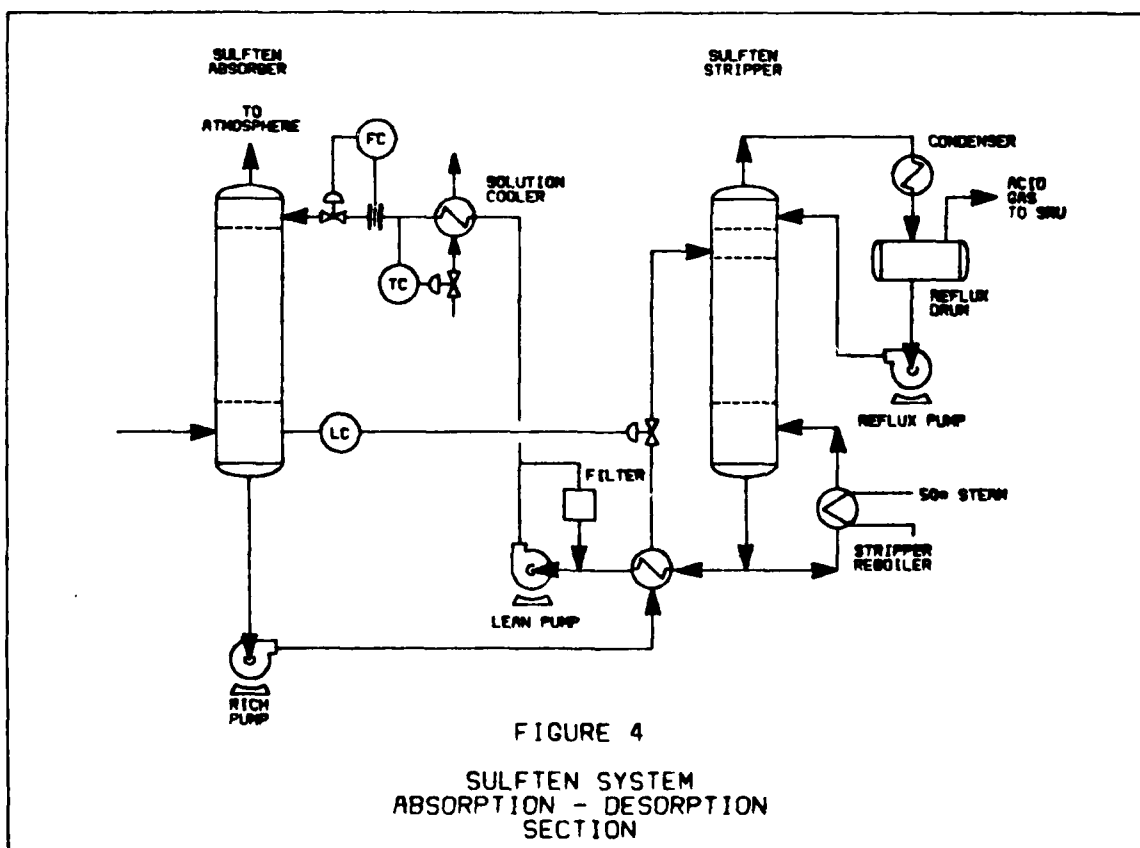


FIGURE 3  
SULFTEN SYSTEM  
COMMON REACTORS



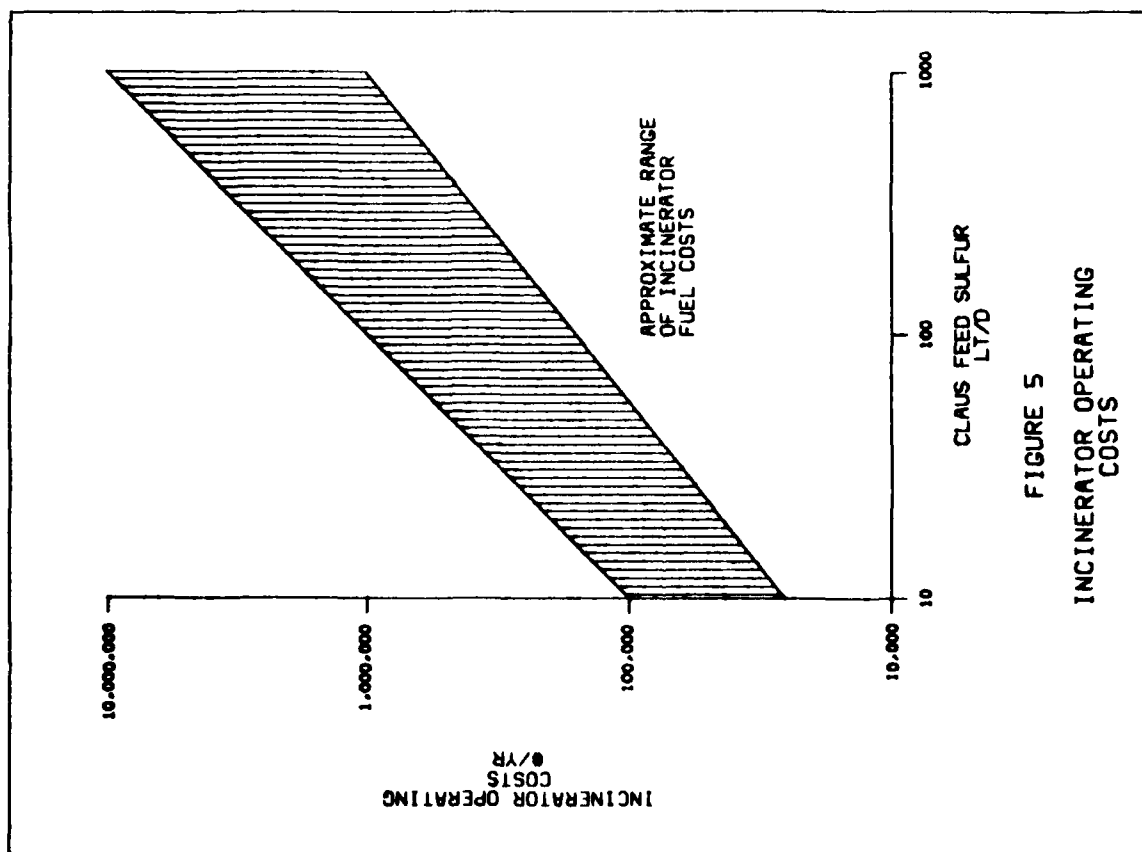


FIGURE 5  
INCINERATOR OPERATING  
COSTS

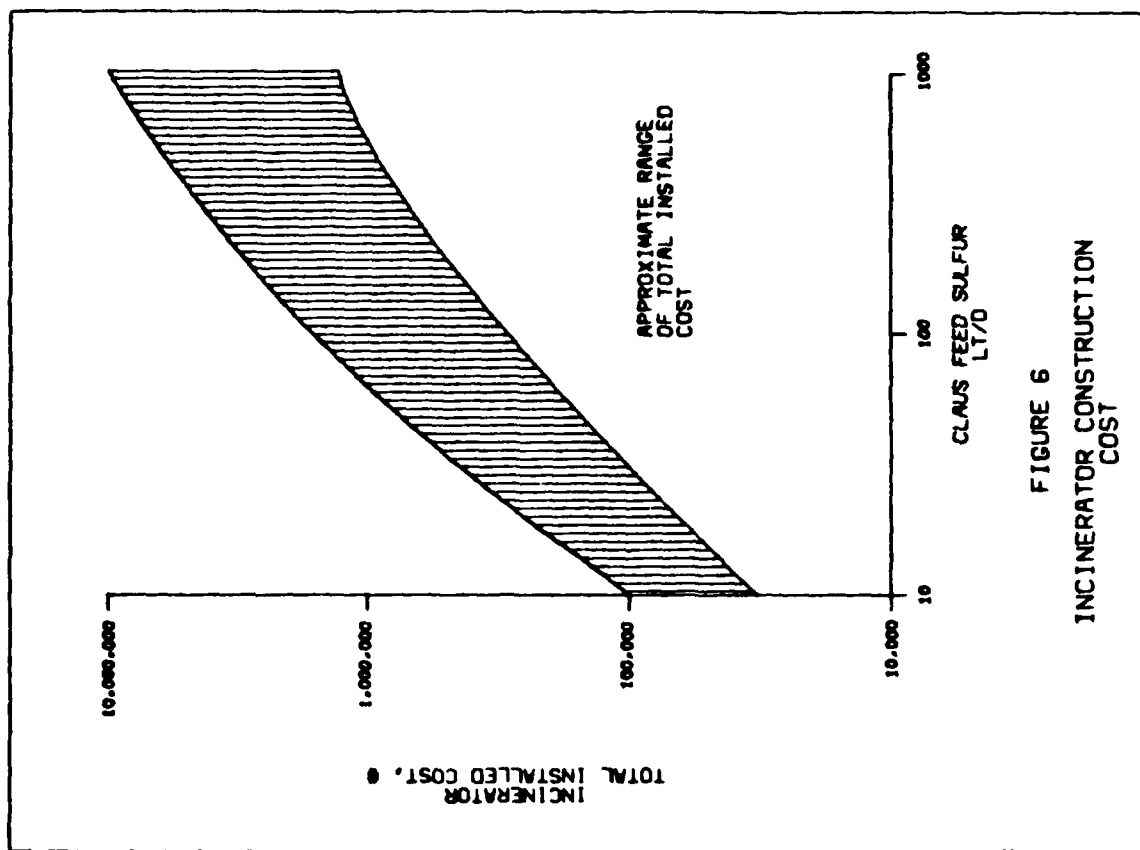


FIGURE 6  
INCINERATOR CONSTRUCTION  
COST

Oak Bend Road  
P. O. Box 676  
Murrell's Inlet  
South Carolina  
29576

April 26, 1984

District Engineer  
U. S. Army Engineer District, Charleston  
Attn: SACEN-E  
P. O. Box 919  
Charleston, South Carolina 29402

Subject: Draft Environmental Impact  
Statement For Oil Refinery  
Georgetown, South Carolina

Dear Sir:

The U. S. Army Corps of Engineers and the cooperating agencies are to be complimented for the preparation of the subject Draft. The comments I have to offer relate to certain conclusions reached from material included in the Draft as follows:

EC-1

1. In the Summary (II.1) paragraph 4 indicates "The proposed refinery would enlarge the economic base of Georgetown County." Since the Draft indicates actual and potential adverse economic impacts on commercial and recreational fisheries, and the businesses dependent on them (See page VI.D. 27 to VI.D. 31) and educational and research activities that study fish and wildlife in Georgetown County, it appears that the adverse economic impacts may more than offset the favorable environmental impact shown in Summary 4. The statement should be modified to reflect this probability.

B-180

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. See also the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of Winyah Bay.

EC-2

2. Since Georgetown County has a high rate of unemployment, the granting of the permit is favored because it will provide employment for approximately 100 people, and for about 40 people in other industries due to the indirect effect from local spending.

The average direct wage in a petroleum refinery is stated to be \$28,000. annually. (VII. D2) The Draft does not mention that very few of the people presently unemployed in Georgetown will be qualified to fill the new positions that would be provided by the completed refinery, and that those qualified would, for the most part, be for positions in pay ranges well below the \$28,000. average. Some mention of this aspect should be made in order not to foster false hopes in the community.

The source of the data on the number of employees and their average wage is the study by Davis & Floyd Engineers, Inc. and Arthur D. Little, Inc. which is cited on page VII.D-2. In view of the numbers of skilled workers laid off or no longer working at International Paper Company and Georgetown Steel, there are probably enough skilled workers available to meet the refinery's needs.

Based on the information contained in the Draft Environmental Statement, it is hard to see how the Permit can be granted, or how the South Carolina Coastal Council can fail to review it's permitting action which was previously taken.

Yours truly,



G. William De Sousa

May 22, 1984

LTC F. Lee Smith  
U. S. Army Corps of Engineers  
P. O. Box 919  
Charleston, S. C. 29402

Dear Col. Smith,

I would appreciate having my comments taken into consideration for the final EIS on the proposed Georgetown oil refinery.

I have studied hundreds of publications describing the effects of acute and chronic oil pollution on the natural resources of an estuary such as Winyah Bay. It is clear that commercial catches of fish, shrimp, and crabs will decline as the effects of chronic oil pollution spread throughout the bay. The time-table for the appearance of noticeable damage to the commercial fishery as a result of chronic inputs may be several years, however, this duration will be decreased substantially as a result of acute oil spillage. The final results are still the same regardless of the time-table, i. e. commercial catches will decline and fishermen and retailers will lose jobs.

B-1

Several items need to be mentioned which were glossed over in the draft EIS. First, some impressions. Georgetown appears to be in the midst of a movement to change its atmosphere and economic base. Noticeable progress is being made in renovating the downtown area and historic section of Georgetown. The sports fishery industry is gaining credible momentum in Georgetown as several large tournaments are now run out of local marinas. These factors plus the encouragement of the Chamber of Commerce are resulting in increased tourist dollars to the area. It is obvious as one drives north on Highway 17 that the commercial impact of the 'Grand Strand' is spreading southward. Location of an oil refinery on the Sampit River will have an adverse impact on the tourist industry in Georgetown County. Degradation of the water will decrease the sports fishery and air-borne refinery pollutants will detract from the appearance of our historic buildings. These pollutants will also be felt by the older retired people moving into the Georgetown community and will be reflected in increased respiratory problems.

One other item not mentioned in the EIS relates to Georgetown's newest industry, aquaculture. Hundreds of acres of quality habitat are currently being utilized for the growth of crayfish. Only a fraction of the viable habitat in the county is currently being harvested. However, growth of the industry has been steadily upward over the last three years. It is evident that the aquaculture industry in Georgetown County is potentially a major source of income to the county and a large employer.

All of the concerns expressed in this comment are addressed in various parts of the DEIS. See the response to comment AW-11 regarding the effect of the refinery on tourism. The degradation of water quality is addressed in Section VII.8 and the effects of this on the sports fishery is addressed in Section VII.C. The contributions of the refinery to air pollution are shown on page VII.A-30 along with those of existing sources.

30-2 Recent research indicates that one of the greatest dangers to the aquaculture industry (especially, the culture of crayfish) lies in the acidification of impounded water by the addition of air-borne pollutants, particularly sulphur compounds such as the large quantities to be emitted by the refinery. Numerous publications relating to the effects of petroleum and acid precipitation upon cultured species are now available in the literature. Unfortunately, none of those effects were mentioned in the draft EIS.

30-3 In conclusion, it hardly makes sense to bring an oil refinery into an area where several existing (tourism, commercial and sports fisheries) and developing industries (aquaculture) stand to experience severe and long lasting damage. An adequate comparison of the number of jobs gained versus those potentially lost by the location of an oil refinery in Georgetown has not been addressed. Such a comparison would be difficult since the sports fishery, tourism, and aquaculture are only in their infancy as Georgetown industries. However, an attempt must nevertheless be made.

I personally feel that the oil refinery should be denied a permit. I am certain that if valid analyses were made of the items previously mentioned in this letter, denial of the permit would be inevitable.

I hope that my comments and those made by other concerned citizens will be adequately reviewed and not ignored or glossed over as were the concerns expressed by the U. S. Fish and Wildlife Service and EPA in the draft EIS.

Sincerely,



William K. Michener  
P. O. Box 1404  
Pawleys Island, S. C. 29585

cc: Brig. Gen. Forrest Gay  
Gov. Richard Riley

Attention is directed to page VII.A-30 for a comparison of existing emissions with those of the refinery. Although the reviewer refers to the "large quantities" of sulfur compounds in the refinery effluent, the amount to be contributed by the refinery would amount to less than one tenth of one percent of the sulfur dioxide emanating from existing sources.

See the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of Winyah Bay.



AD-A152 526

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR OIL REFINERY  
GEORGETOWN SOUTH CAROLINA VOLUME 2(U) CORPS OF  
ENGINEERS CHARLESTON SC CHARLESTON DISTRICT

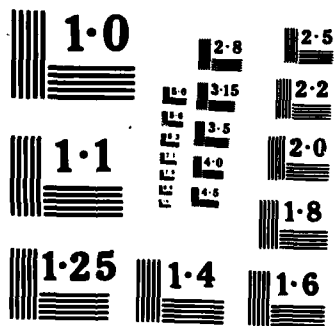
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UNCLASSIFIED

			END										



530 Nowell Street  
Georgetown, SC 29440  
May 23, 1984

Arthur P. Crouse, Jr.  
District Engineer  
U.S. Army Engineer District, Charleston  
ATTN: SACRY-E  
Post Office Box 919  
Charleston, SC 29402

Re: Draft EIS on permit application,  
Georgetown oil refinery.

Dear Mr. Crouse:

As a citizen of Georgetown County who uses and enjoys the environment surrounding Winyah Bay, I wish to comment on the draft EIS regarding the permit application for an oil refinery here. In a nutshell, my comment is this: the draft EIS is inadequate and cannot, without appropriate further study and modification, serve as the basis for a decision of whether to issue or deny the permit. The inadequacy of the document appears on the face of it. It acknowledges that the study does not include important data on how well the bay flushes itself of pollutants and does not detail how well the bottom of the bay cleans itself. (See page VI C-25, 27 and 31.) Without knowing those things, it is impossible to determine whether either large or persistent small spills into the waters of the Sampit river would cause irreparable damage (over the short term or the long term) to Winyah Bay.

As I understand the law, an EIS is supposed to give us enough information to do a cost-benefit analysis. Without information about the self-cleaning qualities of the bay, it is impossible to determine whether the risks to the existing tourist and fishing industries caused by granting the permit (if any) are worth the gamble.

I would appreciate your considering these comments when you make your decision. I would also appreciate your letting me know what you decide by sending me a copy of your decision.

Very truly yours,

*Tom Rubillo*  
Thomas J. Rubillo

Winyah Bay has been the subject of many studies which are reflected in the DEIS. Although there will never be enough study to completely answer all questions, there was enough information to support the analysis in VII.B of the impacts on water quality.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. See also the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of Winyah Bay.

The Record of Decision on this permit application will be distributed to the public.

Box 565,  
McClellanville,  
South Carolina, 29458

District Engineer  
U. S. Army Engineer District,  
ATTN: SACEN-E  
Post Office Box 919  
Charleston, South Carolina 29402

May 22, 1984

Dear Sirs:

I have read the Environmental Impact Statement for the proposed Georgetown refinery. In view of the abundance of new information made available by this study I am (almost) confident the Corps of Engineers will deny the permit.

But I am disturbed and surprised that the Charleston District of the USCE still looks favorably on the project (EIS, V. 7). They give the following reasons for dissenting from the conclusions reached by the bulk of the statement's contributors:

- That various State Agencies have already issued permits. (But these permits were issued without benefit of the information now made available by the EIS. It is hard to see how past decisions made in relative ignorance can be used to justify anything at all.)

- That since biological productivity is maintained at the current level of pollution, it can be maintained at a slightly higher level. (No scientific information or study is cited in support of this very sanguine assumption. And in fact the assumption is undermined by the only scientific studies we have, i.e., the studies contained in the EIS.)

- That a large-scale oil spill is very unlikely. (This is of course, granted by all. But such a spill, should it occur, would be extraordinarily damaging to the Winyah Bay-Cape Romain region. The Charleston District ignores the particular sensitivity of marshland to oil spills (EIS, VII. C-54) and

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

does not even mention the problem of smaller spills which the EIS shows must be regarded as probable.)

The Vinyah Bay - Cape Romain area is a precious, irreplaceable and dangerously fragile natural treasure. One assumes that this is a most unfortunate location for a refinery and the EIS massively confirms that assumption. Had the study been available earlier, I am sure the project would never have come as far as it has.

A classic cost-benefit analysis (so much environmental damage vs. so much economic benefit) cannot be meaningfully applied to this case. The damage is to a national treasure; the supposed benefits are locally confined. The damage cannot be repaired while the economic gains can be achieved by other means. Finally the damage is documented, the benefits are speculative. In fact the refinery could well have an adverse effect on the area's development. With the pending clean-up of International Paper Company's Georgetown plant, the town can begin to pursue the long-stymied development based on the historic charm of the town itself, the beauty of its environment, its water and its proximity to the now-threatened natural reserves. I am not referring only to tourism, though this would certainly be an increasingly important element in the economy. The area can also become a very attractive place for non-polluting and labor-intensive industries. The refinery will not help and may well hinder future development in this direction.

I live in McClellanville, a town whose economic survival depends on the purity of its in-shore and off-shore waters. The few who may benefit in the short term from the refinery will do so at our expense. An oil spill such as the one envisaged in scenario 15 of the EIS would destroy the livelihood of hundreds of people and take the life of a community.

Very sincerely,



Samuel P. Savage, Ph.D

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. However, all available information will be considered by the South Atlantic Division Engineer in making the decision on the permit application for the underwater pipelines.

PO Box 4  
Georgetown, SC 29442  
May 25, 1984

Mr. John L. Carothers  
US Army Corps of Engineers  
Charleston District  
PO Box 919  
Charleston, SC 29402

Dear Mr. Carothers:

After reviewing the Draft Environmental Impact Statement for the proposed oil refinery, I would like to offer my comments for consideration.

I commend you and the Corps for finally accepting the responsibility to conduct an E.I.S. for a project which certainly would have significant impacts on the Georgetown-Winyah Bay area. I also commend you for consulting other agencies for information in their areas of expertise.

It is my understanding that a well-prepared environmental impact statement presents all available facts pertaining to a project in an objective manner so that rational, informed decisions can be made. Some very sound information is presented in the E.I.S. for the proposed oil refinery, especially pertaining to the fish and wildlife resources and environmental consequences on these resources. However, the Corps has chosen to bias the E.I.S. by disregarding and down-playing the findings of these experts. In addition, comparable, factual information on the economic consequences of the proposed project was not included. If, as you state in the summary, the only favorable environmental impact of the proposed refinery would be to enlarge the economic base of Georgetown County, should not the economic considerations be given more attention in the statement? Less than one page is devoted to this area and it deals only with the number of jobs that might be generated by the proposed refinery. How would the project affect the tax base? What effects would it have or could it have on other county industries including fishing, tourism and aquaculture? Is one to assume that the dearth of information presented on economic consequences is a reflection that very little economic benefit to the community will be realized by this project? I suspect that this might be a true assumption.

If I were in a position to make a decision based on the facts presented in the Draft Environmental Impact Statement, I would have to deny the permit. The adverse environmental impacts far outweigh the favorable impacts.

I hope that you will consider these comments and base your decision on all of the facts presented regarding this project.

Sincerely,

*Wendy Allen*  
Wendy Allen

cc: Governor Riley  
Brig. Gen. Gay

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications.

See the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of water quality in Winyah Bay. See also the response to comment AW-11 regarding the possible effects of the refinery on tourism.

P.O. Box 1625  
Georgetown, South Carolina, 29442  
May 23, 1984

District Engineer  
U.S. Army Engineer District, Charleston  
Post Office Box 919  
Charleston, South Carolina, 29402

Dear Sir:

I am a lifelong resident of Georgetown County and have earned Bachelor's and Master of Science Degrees in natural resources conservation and management. Additionally, I am thoroughly familiar with the natural resources of the Winyah Bay area and have been fortunate to enjoy these resources both in a consumptive and non-consumptive capacity for many years. Consequently, the impacts of the proposed oil refinery on the Winyah Bay area are of my genuine concern.

I have reviewed the Draft E.I.S. and concur with the conclusions reached with regard to the adverse environmental impacts as described in the summary section of the document. However, I strongly disagree with the Corps of Engineers as to your evaluation of the environmental impacts as described on page V.7 and V.8 (Table V.1). The basis of my disagreement with the Charleston Districts views are as follows:

- 1) Although the various state agencies (DHEC, WRC) may be qualified to quantitatively predict discharges and emissions of pollutants, these agencies do not have sufficient expertise to properly evaluate the effects of such pollution on fish and wildlife populations and habitats. The primary State agency responsible for managing natural resources, the S.C. Wildlife and Marine Resources Department Commission, has opposed the issuance of the oil refinery permit based on the Department's staff determination that significant adverse impacts would occur on the natural resources (freshwater and marine fisheries, game, nongame, and endangered species) of the Winyah Bay area. While the SCWA MRD is not an actual permitting agency, their concerns have been omitted from the Draft E.I.S. section on the findings of various appropriate State agencies.

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

District Engineer  
Page 2  
May 23, 1984

Therefore, I urge the Charleston District to include the SCWHRD findings in the final E.I.S. and to revise your evaluation of potential impacts accordingly.

- 2) I strongly disagree with the projected effects of refinery operation. When considering the numerous irreplaceable natural resources of the Winyah Bay area, the long term effects of a daily increase of 9.3 percent in oil and grease pollutants is indeed significant. Furthermore, the Draft E.I.S. notes that adequate data are not available concerning the impact of chronic discharges and unavoidable handling losses; however, due to special characteristics of Winyah Bay, these impacts could be magnified and would contribute to further degradation of fish and wildlife resources (pages VII. C-19 and C-20).

- 3) Although the probability of a large oil spill may be remote, the risk to invaluable natural resources of local, state, and national significance are not worth gambling against. The economic and intangible values of the resources described on page VII.C-56, when considered individually or in a collective fashion, certainly exceed the questionable economic benefits of the proposed refinery.

In summary, I feel that the Corps of Engineers utilized extremely poor judgement in evaluating adverse impacts of the proposed refinery and the Charleston Districts views as expressed in the Draft E.I.S. are unacceptable in their present form. Therefore, I strongly urge your agency to revise the Draft E.I.S. such that the final document more accurately reflects the findings of the EPA and the USFWS.

Sincerely,

*Michael B. Prevost*

Michael B. Prevost

CC: Governor Richard W. Riley  
Senator Strom Thurmond  
Senator Ernest F. Hollings



May 15, 1984

LTC F. Lee Smith  
U.S. Army Corps of Engineers  
P.O. Box 919  
Charleston, SC 29402

Dear Col. Smith,

I would appreciate your consideration of my comments in preparing the final draft of the Environmental Impact Statement on the proposed Georgetown refinery.

First I would like to identify myself as a professional scientist who has dedicated my career to the study of estuarine and coastal ecosystems. I have spent thousands of hours collecting and analyzing data from East coast estuaries and have probably spent more time studying the estuarine fauna of Winyah Bay than anyone. I have studied the scientific reports of hundreds of other scientists who have worked with the effects of petroleum in marine and estuarine ecosystems. I grew up and worked in the shadows of large refineries on the Delaware River and tributaries in Philadelphia, PA. I know what the long term effects of even a relatively small refinery on the Sappit River in Georgetown, SC will be. The worst place to situate such a heavily polluting industry is in an estuary, and there are not many other estuaries in the world that would be more vulnerable to oil pollution than Winyah Bay. No single environmental perturbation poses as great a threat to the future of an estuary as an oil refinery.

I have reviewed the Draft EIS several times and I keep trying to find how you can justify the statements made on page V.7.. The cooperating agencies provided you with the highest quality information with respect to the likely effects of plant operation and accidents available. Their analyses were thorough and their summary statements were substantiated by facts. In general, their assessments of what most of us consider certainties were conservative. No matter how you interpret their analyses, you cannot justify the conclusion that the proposed project does not constitute a significant threat to the quality of life (in its broadest sense) in this area.

It is very disturbing to realize that such major decisions regarding the future of the environment are made by individuals who are not only lacking in any understanding of the environment, but who do not respect the opinions of those who dedicate their entire lives to the study of ecosystems. Further, it is inexcusable to spend or cause the expenditure of such enormous amounts of tax dollars for the purpose of gathering information upon which a rational decision on the project can be made only to ignore and misconstrue such information in the final analysis and recommendation.

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

I hope that you will review all of the material pertinent to this issue, including the numerous letters written by citizens more knowledgeable than yourself about the environmental consequences of a refinery in this area, and recognize that the only alternative for the CRDC application is "permit denial".

The Corps will review and evaluate all information in the DEIS before making a decision on the CRDC permit application.

Sincerely,



Dennis M. Allen, Ph.D.  
P.O. Box 4  
Georgetown, SC 29442

DMA/spe

cc: Brig. Gen. Forrest Gay  
Gov. Richard Riley

WILLIAM J. CLARK  
WAVERLY BLUFF, BOX 1500  
PAWLEY'S ISLAND, S.C. 29665

May 1, 1984

Lt. Col. F. Lee Smith, Jr.  
U. S. Army Corps of Engineers  
Charleston District  
P. O. Box 919  
Charleston, SC 29402

Dear Colonel Smith,

I appreciated the opportunity to speak at the public hearing held on April 26 in Georgetown, SC, on the Draft Environmental Impact Statement for a proposed oil refinery in Georgetown. For the record, I am submitting in writing the comments I made that evening from notes.

My name is William Clark, and I live in Georgetown County. I was formerly an executive with a large, international chemical company and am now an independent businessman.

I have followed the proposed refinery project for several years in the newspapers and have been mildly for the project, largely on the basis that it would provide some much-needed employment opportunities for Georgetown County. However, recently I have become convinced that the requested permits should not be granted for two reasons - one, environmental, and the second economic.

First, with respect to the environment, the Draft E.I.S. clearly shows that there will be detrimental effects to the local environment in terms of both air and water pollution and that the effects of an oil spill, no matter what the calculated odds, could be severely damaging, particularly to the waters and marshes of Winyah Bay. Others have spoken at this meeting far more eloquently than I on this issue. Suffice it to say that, after recent personal investigation, I have come to share the view that Winyah Bay with its surrounding wildlife sanctuaries and research stations, is a priceless national treasure which must and can be protected at all costs.

Secondly, however, I have also come to question the validity of the project on the basis of its credibility as an economic endeavor. The Draft E.I.S. provides the only favorable justification for the project in one sentence: "The proposed refinery would enlarge the economic base of Georgetown County, one of the most economically depressed counties in South Carolina".

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications.

Page 2  
Lt. Col. F. Lee Smith, Jr.  
May 1, 1984

I question that statement, because I maintain that the proposed refinery concept is not a viable economic proposition. If indeed it is not, then all the promises of additional jobs and tax revenues are worthless.

I know enough about the oil business to know that the economics of this industry have changed drastically during the last three years. It is a fact that major oil companies have permanently closed down or dismantled a substantial number of refineries, most of them small, but also most of them larger than the proposed Georgetown refinery. And that has occurred despite the fact that many of these small refineries were highly depreciated, and therefore carried relatively low capital costs in their operation, where capital costs normally contribute a high percentage of total fixed costs.

At the same time, many of the major oil companies have spent billions of dollars to convert their larger refining facilities to handle the high-sulphur or heavy crude oils available from Western Hemisphere sources by sea to the Gulf Coast and Caribbean ports. Much of this money was spent for new technology which would provide for both low cost product output and efficient treatment of air and water pollutants to acceptable levels.

How can this little 30,000 barrel per day refinery in Georgetown compete with these modernized and efficient large plants? I submit that it cannot. If it cannot, then it will be a money loser, and that will be a disaster. If it is an economic loser, then the results will be obvious:

1. Maintenance costs will have to be cut, with the result that the frequency of system breakdowns will increase and the probability of accidental or chronic discharge of air and water pollution will increase.
2. Funds for capital improvements will not be available so that investments required to obtain the latest technology to keep the plant competitive and within reasonable pollution limits will not be made.
3. Sooner or later, job layoffs and shutdowns will occur, so that one fine day there will be no jobs and no tax revenue, and the economic advantages forecast for the plant will go down the drain with the pollutants.

More importantly, if this scenario unfolds, all of us will have wasted several years and several hundred thousand dollars in taxpayer money trying to justify a project that is doomed from the start.

Page 3  
Lt. Col. F. Lee Smith, Jr.  
May 1, 1984

Somewhere in this process we - we, the people - should require solid evidence of the financial capability of the promoters of this ill-conceived project and of the long-run economic viability of their proposed plant. After all, we are not dealing here with an Exxon or a Shell, but with financial promoters of unproven background. Who of us has questioned why a similar project of Carolina Refining was turned down in Wilmington, N. C. or why their proposed refinery in Savannah was never built, even though permits were obtained?

If this project goes ahead, I feel certain it will be a case of "selling our souls for a mess of pottage". Lets abandon this dubious enterprise now and concentrate our efforts on obtaining new industry for Georgetown County that can provide lasting jobs, and whose "dry cargo" raw materials and products are compatible with the protection of our unique natural resources.

Thank you.

Yours very truly,

*William J. Clark*  
William J. Clark

WJC/mjz

CC: Ms. Patricia Jerman  
Director, Governor's Div. of Natural Resources and the Environment

Mr. Jack Kendree, Executive Director  
Georgetown County Development Commission

Honorable Douglas L. Hinds  
Hinds, Cowan and Strange

Dear Sirs, 7 May 1984

R2: O.I. Refinery Proposed  
Georgetown, S.C.

Please Stop it NOW! I'm not  
to sure ABOUT all the facts + figs.  
everyone has come up with - on  
the opinion of the Environmental Impact  
Statement! All I know: hard enough  
to BREATHE here now - A steady decrease  
in AVAILABLE unpolluted mens do fish,  
hubb + no Boat - 7 years, I see less +  
less each - 120 NOW JOBS - How many  
locals lose JOBS if or when a  
spill occurred - How many people here  
M.B., McClellenville depend upon the  
Environment! Where will the Cost/Benefit  
BE. PLEASE, PLEASE Give this Project  
close scrutiny then tell them to  
locate it Else Where! — over please

B-124

BK-1

See the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of water quality in Winyah Bay.

BK-2

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications.



**Research Planning Institute, Inc.**

925 Gervais Street  
Columbia, South Carolina, USA 29201  
Telephone (803) 256-7322/254-1104  
Telex 573468 RPII CLB

May 16, 1984

Mr. John L. Carothers, Project Manager  
U.S. Army Corps of Engineers,  
Charleston District  
Post Office Box 919  
Charleston, SC 29402

RE: Draft EIS for an Oil Refinery in Georgetown, SC

Dear Mr. Carothers:

Thank you for the copy of the above Draft EIS which we have reviewed. We would like to offer the following comments and recommendations concerning water quality, sedimentation, and oil spill probability modeling.

1) We find your recognition of the scientific effort placed into the EIS (page V.7) unfortunate and unfitting. We do not concur with the Corps' use of permits and certificate issued several years ago as taking precedence over recently-collected scientific information.

2) Field data are needed to establish circulation patterns, flushing rates, salinity distribution, and suspended sediment distribution throughout Winyah Bay and the Sampit River. There is a paucity of field measurements presented in the report (or available at this time) on which to test and verify a site specific estuarine flushing model. This information is basic for modeling pollutant loading in the bay and estimating residence times. Without prototype data, it is impossible to predict with a reasonable degree of certainty the fate of an oil spill anywhere in the bay.

3) The RECEIV II model is by no means state-of-the-art since it is one-dimensional and assumes vertical homogeneity in the estuary. As the EIS reports, Winyah Bay is a partially stratified estuary, and by implication, must experience vertical as well as horizontal gradients in salinity. Therefore, a two- or three-dimensional model should be applied and tested against seasonal density measurements. A field monitoring program

See the response to comment AC-2 regarding the deletion of material on page V.7 and the revisions of Table V.1 to reflect impacts identified in the DEIS but not addressed in the table.

Predictions of the fate of oil spills in Winyah Bay was not specifically included in the draft EIS. Rather scenarios were developed that estimated the initial movements of oil spills and subjective assessments were made of expected impacts to sediments. Predictions of the movement of oil slicks were based upon a relatively simple model. Qualification comments on its use are presented on page VII.B-44. It is felt that the results of this modeling are adequate for forming general opinions on the impact of various spill scenarios, even though doubt remains as to the specific movement and impacts of the spill due to the lack of adequate flushing and circulation studies and a comprehensive hydrodynamic model.

The use of the RECEIV model and its limitations have been reassessed in the FEIS and changes were made to indicate its general inapplicability to Winyah Bay. Nevertheless it is felt that it is a useful tool for simulation within the Sampit River. Winyah Bay has been the subject of many studies which are reflected in the EIS. Although there will never be enough study to completely answer all questions, there was enough information to support the analysis in Section VII.B of the impacts on water quality. While predictions of the fate of pollutants may lack certainty, the potential impacts on aquatic resources in Winyah Bay can be predicted with sufficient accuracy to enable the Corps to determine whether or not it is in the public interest to issue the permit for the underwater pipelines.

should be initiated before permit approval to determine the temporal and spatial distribution of currents, temperature, and salinity. These data should be used to calibrate a two-dimensional flow model which will more accurately reflect flushing and residence times of pollutants introduced into Winyah Bay. The model should also account for variations in wind stress and resultant mixing processes.

4) Little is known about the rates and distribution of sedimentation from suspended sediments entering Winyah Bay. The fate of oil spills will be closely related to sedimentation dynamics due to adsorption of oil on fine-grained particles and agglomeration, or flocculation of particles, sediment settling, and resuspension. This also is basic to predicting the fate of spilled oil and assessing potential environmental impacts.

5) The trajectory models presented are very misleading in that they are run for only one tidal cycle. The scenarios postulated for a 140,000 barrel spill would clearly spread oil all over Winyah Bay, and not be limited to only its upper reaches.

B-108

Agreement with this general comment is reflected in the discussion in Section VII.B.2.b(4)(b) - Data Limitations.

The modeling of spills over only one tidal cycle was clearly qualified on page VII.B-44. Where necessary in scenario discussions, the limitation was also mentioned. Therefore it is not felt that the presentation is misleading. It is understood that this method of scenario presentation does not carry the spill to its ultimate dispersion. The available model is not designed to fully evaluate the life of a spill in Winyah Bay and extrapolating movement beyond about one tidal cycle would entail reporting movements based upon too many assumptions and estimations. It is unfortunate that a verified transport model does not exist to evaluate both pollutant movement and sediment distribution but, in its absence, the Winyah Bay oil spill trajectory model was the best predictive tool available.

6) In following through on the postulated scenarios, several points concerning oil chemistry and particle interaction are misstated. Oil incorporation into bottom sediments (particularly muds) can take place by direct dissolution (see Payne et al., 1984). The major sediment interaction occurs between the aliphatic components and not aromatics. Since diesels and jet fuels contain mostly aliphatics, sediment interaction and sinking could be greater (not less as stated) than for similar quantities of crude. However, in all cases, it appears that although very biologically damaging, the amount of oil sinking to the bottom would probably be on the order of 10 percent (Gundlach et al., 1983). The DEIS insinuates much greater values.

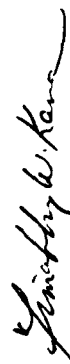
In this comment, it is suggested that the amount of oil sinking to the bottom would probably be on the order of 10 percent, while in the DEIS, much greater values were given. It should be pointed out that Bachaquero, Venezuela crude oil has very high percentages of the heavy fraction and that the CRDC facility would be designed to process this type of crude oil. Thus the EIS indicated that spills in the Winyah Bay area would result in greater quantities of oil sinking than in other spill situations, such as the Amoco Cadiz, where the heavy fraction was smaller. Oil sinking to the bottom could be significantly higher than 10 percent, but to an unknown degree in the absence of laboratory studies. This problem is discussed on page VII.B-76. See the revisions to VII.B-87, 88, 89, 90 and 91.



- 31-7 7) Two major factors are neglected in the discussion of potential impacts: (1) that shoreline stranding is the major sink of spilled oil--perhaps 50 percent in relatively sheltered and enclosed estuaries such as Winyah Bay (with its surrounding marshes), and (2) that emulsification is not mentioned even though it can more than quadruple (20 percent oil, 80 percent water) the volume of the remaining surface oil. In several cases, the scenarios rightly subtract evaporation but neglect to add emulsification, which will increase the total area which will probably be affected.

The Draft EIS has obviously involved extensive effort by many individuals. This is to be commended. However, there is no substitute for site specific field data in a permit application with such long range implications. We believe it is imperative that prototype data be obtained for application to accepted models. Only then can the permit application be judged using objective criteria.

Sincerely,



Timothy W. Kana, Ph.D.  
Director  
Coastal Science & Engineering

and



Erich R. Gundlach, Ph.D.  
Senior Scientist

With reference to comment no. 6, if oil sinking is significantly greater than 10 percent as is expected, this would decrease the shoreline stranding estimate of "perhaps 50 percent" to a lesser albeit unknown quantity. A discussion was presented on page VII.B-48 on shoreline stranding and how it was considered in the spill scenarios.

Emulsification was discussed on page VII.B-93 of the draft EIS, but additional discussion and comments were added to the text on pages VII.B-44, 88, 89, 90, 91 and 92.



THE UNIVERSITY OF NORTH CAROLINA

AT  
CHAPEL HILL

Department of Zoology

The University of North Carolina at Chapel Hill  
Wilson Hall One A  
Chapel Hill, N.C. 27514

May 1, 1984

District Engineer

U.S. Army Engineer District Charleston

Attn. SACEN-E

P.O. Box 919

Charleston, S.C. 29402

Dear Sir,

I have a number of comments on the Draft Ecological Impact Statement compiled by your office in response to the application by the Carolina Refining and Distributing Co.

I am a PhD student in Biology at University of North Carolina at Chapel Hill, N.C. For the last five years, I have been conducting field research on the ecology and behavior of White Ibis nesting in lower Winyah Bay. My comments may appear lengthy, but I think you will agree, are nontrivial. I write these comments as a concerned individual, and do not represent any organization. I address three subjects: Containment and Cleanup, Impact on Wading Birds, and Economics.

I. Containment and Cleanup of Oil Spills

A. Current Velocity Limitations - In the Ecological Impact Statement, it is stated (VII B-101) that containment boom failure can be expected to occur with currents exceeding 1.5 knots, and that "acceptable" performance can be obtained in "faster current situations". Further, it is reported, current speeds in Winyah Bay have been "found to exceed" 1.5 knots.

Current speeds for Winyah Bay were estimated based on data and information provided by May and noted on page VII.B-101. The reference to acceptable performance for booms deployed under conditions of greater current velocities concerns their use in a free floating situation. Opportunities for this method may not exist for spill scenarios in Winyah Bay.

I can find no reference to:

- Exactly how fast currents in Winyah Bay range, or even average.
- What "faster current situations" constitute, and how the "acceptable performance" is obtained.

Winyah Bay is the confluence of one major and three minor river systems; furthermore, the bay has a tidal range averaging about 5 feet in lower sections. I suggest that there is every reason to believe that current velocities in Winyah Bay are commonly outside the working range of containment booms, and may well make containment of any size spill impossible in most situations.

8. Depth Limitations - Water Depth is another stated limitation of containment boom deployment; two to three feet is the cited lower limit. Using planimeter measurements of shoal areas at mean low water from NOAA soundings chart #11332(1982 updated), I have found that over 48% of Winyah Bay waters covered area only, South Inlet to U.S. 17 Bridge) is of a depth of less than 3 feet. There is no mention of this fairly obvious fact in the EIS, other than "water depths to be expected" in areas "such as Mud Bay" (VII B-101).

Given the above information, it seems clear a more realistic assessment of spill cleanup and containment scenarios is needed. Almost certainly the bay is so shallow booms cannot be deployed with any effectiveness. In deeper areas, where they might be more useful, are channels with sharp turns, where current velocities are most extreme; and as I have pointed out, they will be commonly too strong for containment operations.

Winyah Bay, it seems, is an extremely difficult to conduct cleanup operations. Even very small spills, (the most likely kind to happen), may well be uncontrollable, and unrecoverable in most situations. The inability to control or clean up a spill can well make the difference between a planned accident of little impact, and a federal-response disaster. I am particularly concerned that the EIS overlooked these crucial, non-controversial facts, and feel strongly a reassessment of the cleanup and containment procedures should be done before any conclusions are drawn from the EIS.

Page VII.B-11 has been revised to address the use of booms in Winyah Bay and the employment of response teams. A consideration of depths in the bay and slow response time is specifically addressed. See also the response to comment AV-20 regarding oil spill contingency plans.

## II. Economic Impact

In the EIS, (VI D-29,30), there is no dollar value placed on Recreational and Sports Fisheries for Winyah Bay. It is stated that the growth of this fishery "is the fastest in the state", and that the total South Carolina saltwater angling input (residents only) is worth 117 million dollars annually.

Because the decision over the refinery will have to be made to some extent on a cost-comparative basis, it is extremely important not to omit any major economic sectors. Winyah Bay's input into the state resident saltwater angling value must be sizeable, and minimum estimates should be made.

If Winyah Bay's input to the state figure is one percent, this would give a figure of 1.17 million dollars annually. Certainly, Winyah Bay represents more than one percent of South Carolina's coastline, and has a better than even chance of attracting fishermen, having easy access from U.S. 17 and a large and growing charter fishing fleet. Even if a figure of one half of one percent (surely a conservative figure) is used, one still obtains the figure of 570,000 dollars annually. It must be remembered that this figure excludes nonresident fishermen. Georgetown's growing tourist industry, proximity to Myrtle Beach, and growing offshore charter fleet indicate the output of state angler input must be considerable.

I will now refer to the Balance Sheet (page four). The oil refinery is optimistically expected to bring 2.9 million dollars annually to the area. If landings values (Table VI D-5) of commercial fisheries in Winyah Bay are averaged for 1981 and 1982, they are worth somewhere around 1.4 million annually. One half of one percent of the State resident saltwater angling figure (as above) is 570,000 dollars annually. To update the tourism input, I have added 8% to the combined Travel Expenditures and Tourism Payroll figures for Georgetown County. 8% is the derived annual increase for 1981-1982 (VI F-11). Research is simply the figure stated in the EIS for the USC Marine Lab payroll. All of the above figures are conservative, with the exception of the oil refinery input.

The response of each of the "Potential cost" sectors to an oil spill are difficult to quantify; each will react differently. Sports and Commercial fisheries will undoubtedly be most sensitive to spills of any sort. Tourism, to the extent that spills affect beaches, and notably, the

See the response to comment AL-1 regarding the Corps' evaluation of the economic aspects of permit applications. See the response to comment AE-6 regarding the comparison of economic gains from the refinery with potential economic losses due to degradation of water quality in Winyah Bay. See the response to comment AM-11 regarding the possible effects of the refinery on tourism.

Balance Sheet

<u>Potential Gain from Oil Refinery</u>		<u>Potential Loss From Oil Refinery</u>
-Annual Payroll	\$2,900,000	-Commercial Fisheries \$1,441,214
Jobs	140	(Jobs -over 400)
		-Sports and
		Recreational Fisheries \$570,000
		(Jobs = ??)
		-Tourism
		\$44,982,799
		(Jobs - 955)
		-Research
		324,000
		(25 jobs)
<hr/>		<hr/>
TOTAL	\$2,900,000 annually	\$47,318,013 annually
	140 jobs	1,380 jobs

Georgetown waterfront area along the Sampit river, will show an immediate and massive response. Research will only be affected if a spill reaches the North Inlet marsh.

The input from the oil refinery represents only 5.77% of the total of all inputs mentioned. Another way to look at this fact is to realize that the potentially impacted industries would only have to grow by 5.77% to totally compensate for the oil refinery.

The impact of small, non-catastrophic spills on local economic sectors is almost impossible to assess. The impact of a catastrophic spill (140,000 barrels) is much clearer. If one assumes 357 years must elapse before a catastrophic spill occurs (VII B-42) the oil refinery would by then have contributed 1.04 billion dollars to the local economy. This figure could be contributed by the potentially affected industries in 22 years. It is important to realize, then, that after the 357 year spill, the potentially affected industries would have to be able to return to full capacity in less than 22 years in order for the oil refinery to be a cost effective option for Georgetown County's economy.

### III. Impacts on Wading Birds

The wading bird rookery at Pumpkinseed Island is the largest White Ibis colony on the East coast, and one of the three largest wading bird colonies on the East coast. Due to several considerations not mentioned in the EIS, the impact of the proposed refinery on wading birds will be much more severe than proposed. Further, there will probably be a significant impact of the loss of the Pumpkinseed rookery on the local fisheries, also not mentioned

Pages VII.C-36 and VII.C-58 predict the loss of wading bird feeding and nesting habitat including the loss of Pumpkinseed Island as a rookery. We can not conceive of this as an underestimate of impacts to wading birds.

There is no doubt that a spill reaching the mid-Bay region, irregardless of the time of year, would have an adverse impact on the low-lying Pumpkinseed Island rookery. In keeping with the worst-case direction of the oil spill scenarios, spill cases 12 and 13 were highlighted in the document because they occurred during the time of the year coinciding with the presence of the greatest numbers of birds at Pumpkinseed.

in the EIS.

#### A. Impact on the Pumpkinseed Island Rookery

The surface of Pumpkinseed Island is intertidal, being covered on most high tides. An oil slick occurring at any time of the year, then, will affect the vegetation (primarily Juncus roemerianus) upon which the birds nest. Wading birds are known to frequently change colony sites in response to vegetation degradation (Weise, 1978, J. Kushlan, J. Cely pers. comm.). Chances of returning to a previous colony site are unknown, and probably slight.

Because Pumpkinseed Island is intertidal, many nests are touched and frequently inundated to some degree by high tides. If an oil slick hit the island during the breeding season, then, nearly all the eggs of nearly all nests would be poisoned, even if adult birds avoided feeding in oiled areas, and did not transfer the oil to eggs themselves.

Finally, the scenarios for oil spills cite effects on Pumpkinseed Island only in the breeding season. From five years of observations, I can show that the breeding season for most species nesting on the island extends from mid-march until mid-July. Juveniles and adults use the colony as a roosting area through October. The island is only uninhabited for four months of the winter.

#### B. Effects of Wading Birds on Winyah Bay

In a recent study, (Christy et al, 1981) estimates were made of nutrient exchanges in the North Inlet marsh due to birds. One of the findings was that over seven tons of excreta are transported to Pumpkinseed Island each year (R. Mutcherson, pers. comm.). Because most of the island surface is rinsed weekly by tides, this fertilizer is certainly enriching the local waters; as evidence that it is not staying on the island, the vegetation never gets "burned out" as in most colonies (Weise, 1978, J. Parnell, pers. comm.). The fertilizer's effect on local productivity of fish and shrimp is totally unknown, but is almost certainly nontrivial. The EIS has overlooked both the presence of this avian-dependent resource, but also the effect its removal might have on the local fishery.

In sum, the EIS has underestimated several impacts related to wading birds. First, the nests and birds on Pumpkinseed are far more vulnerable than supposed, due to the intertidal nature of its elevation. Second, the vulnerability of this resource is clearly year-round, due to the impacts on vegetation.

Third, the birds are vulnerable for all but four months out of the year, instead of the stated spring months. Fourth, because of containment boom limitations (see above), even a small spill that enters Mud Bay will be uncontrollable, and irretrievable. Fifth, the contribution of many tons of avian excreta to the local fisheries is unknown, but there is every reason to believe it is important. Finally, the loss of the rookery at Pumpkinseed, one of the largest on the East Coast, and probably in the nation, is likely to be irreversible, and could easily occur in response to an out of season spill which alters the vegetation.

If, as the EIS states, (VII B-42) a 1000 to 2000 barrel spill will most likely occur once every 19.3 to 27 years, Pumpkinseed Island can probably be expected to experience a spill of some size in the next 80 years, (at the very least), and probably be lost permanently. It is difficult to see why this kind of loss does not represent a very significant environmental impact.

#### Summary

In sum, my three most serious criticisms of the EIS are:

- 1.) The assessment of emergency oil spill procedures and logistics is completely lacking some crucial considerations, which make the application of containment booms to most situations in Winyah Bay ineffective.
- 2.) Impacts on the local economy are not nearly far-reaching enough. There is no estimate made of a significant sports and recreational fishery, no update of a large and growing tourist industry, no mention of the compatibility of the refinery with a planned tourist-oriented development of the Sappit River Waterfront, and finally, essentially no cost-benefit analysis of the industries that would be affected severely by an oil spill.
- 3.) Impacts on wading birds are likely to be more severe than proposed by the EIS, be more likely to be long term, and be quite likely to affect the local fisheries.



I firmly believe these flaws are serious enough to affect the recommendations instituted as a result of the EIS, and as such, they must be addressed before any permit granting process is started.

Respectfully yours,

*Peter Frederick*

Peter Frederick

LITERATURE CITED

Christy, R.L., Bildstein, K., and P. DeCoursey (1981) A preliminary analysis of energy flow in a South Carolina salt Marsh: Wading Birds.

Colonial Waterbirds (4) 96 - 103

Weise, J.H. (1978) Heron Nest-Site Selection and its Ecological Effects .  
National Audubon Research Report #7 27-34

# APPENDIX C

## COMMENTS ON THE DRAFT EIS NOT REQUIRING A SPECIFIC RESPONSE IN THE FINAL EIS

<u>Name</u>	<u>Date</u>
Mrs. Frederick Moxley	3 May
William D. Anderson, Jr.	4 May
Ken Stouffer	5 May
A. Mitchell Godwin	9 May
Sam B. Crayton, Jr.	9 May
Jack M. Scoville, Jr.	18 May
Catherine Porter Tupper Jessen	21 May
John S. Wilson	22 May
Virginia Christian Beach	23 May
Susan Hindman	23 May
Robert D. & Claudia K. Insley	23 May
William Youngman	23 May
Robert G. Clawson, Jr.	24 May
Caroline O'Rourke	24 May
Nora Manheim	24 May
Frederick W. Moxley	24 May
Thomas A. Cutlender	24 May
Thomas W. Graham, III	25 May
H. P. Worrell	25 May
Jean R. Yawkey	25 May
Martha P. Hutto	25 May
Marth R. Bigelow	26 May
Mr. & Mrs. Donald K. Riedesel	26 May
Sara S. Graham	26 May
Lanie Youngman	27 May
Stephanie Waldron	27 May
Margaret Bissell Fulcher	-
Rigel E. Graham	-

409 Helms St.  
Hogston, S.C. 29440  
May 3, 1984

Corps of Engineers  
P.O. Box 919  
Charleston, S.C. 29402

Attention -  
The Winyah Bay area, the rivers and estuary system draining into it, have already been recognized as unique, and one of the few remaining pristine areas left along the East Coast. chronically. The same body of water attracts industry and their accompanying pollutants.

Hundreds of commercial and recreational fishermen from South and North Carolina fish these waters. Tourist industry thrives. It would seem that by allowing Steel Mill Refinery into an area that already has a manufacturing plant within a few miles of one another, and all draining into the Sampit River, you would be tipping the scale toward the demise of the Bay, and setting in motion a serious potential threat to the ecological and economical future of Hogston and the surrounding area.

I am opposed to any oil refinery, large or small, and I urge you to deny Carolina Oil Refinery a permit.  
Your final decision should be what is honestly best for the most people.

Sincerely -  
Mrs. Fredrick Moxley

TELEPHONE  
AREA 803 795-3718

College of Charleston  
GRACE MARINE BIOLOGICAL LABORATORY  
205 FORT JOHNSON  
CHARLESTON, SOUTH CAROLINA 29412

4 May 1984

District Engineer  
U.S. Army Engineer District, Charleston  
ATTN: SACEN- E  
P.O. Box 919  
Charleston, South Carolina 29402

Dear Sir:

This is in reference to the Draft Environmental Impact Statement (DEIS) for the permit application by Carolina Refining and Distributing Company for installation of two underwater pipelines across the Sampit River at Georgetown, Georgetown County, South Carolina. In the DEIS there is ample evidence presented to show that both acute and chronic pollution to air, water, and wetlands of the Sampit River - Winyah Bay system will occur during both construction and operation of the proposed refinery. Pollution of air, water, and wetlands can be expected to occur at certain levels no matter what precautions are taken. The cumulative effects of low level pollutants can over a period of time result in the severe deterioration of environmental quality. A large oil spill would be disastrous. On p. 11, 6 of the DEIS I find, "The effects of any of the total loss spills within Winyah Bay would be devastating and it is unlikely that this highly productive estuary would ever recover to pre-spill condition." The Winyah Bay estuarine and wetland system is a national treasure, so much so that over 60,000 acres have been set aside in perpetuity for the protection of the system. The area is so important for commercial and recreational fisheries, research, education, and conservation that we cannot run the risk of allowing it to deteriorate in environmental quality.

In view of the very great dangers to the natural environment that would result from the proposed refinery and the relatively small economic benefits of its operation, I strongly urge you to deny the application for the permit.

Yours very truly,  
William D. Anderson, Jr.  
Professor of Biology

RECYCLED

Sat May 5, 1984

Sir:

Enclosed is a letter I wrote to the editors of the Georgetown Times. It pretty well sums up my feelings about the oil refinery. I am a self employed carpenter and as such would not doubt it

benefit economically from 100 additional jobs in my town. I would not benefit if the pollution generated by these jobs made the water in the river behind my house even dirtier or made the downtown area less attractive for residents. I don't know that Mr. Exarance or you will have to live with the environmental consequences of an oil refinery in Georgetown. My family, my neighbors, and I would have to if a permit is granted.

For these reasons I urge the Corps of Engineers to deny a permit to Carolina Refining and Distributing Co. for a pipeline under the Santee River.

Sincerely,

Kean Stouffer  
411 Front St.  
Georgetown  
S.C.  
29440

April 28, 1984

Sir:

I attended the public hearing about the Corps of Engineers' Environmental Impact Statement about the location of an oil refinery on the Sapit River. I've been living in this county for over 8 years now and in South Carolina for 28 of my 33 years. I plan to continue living here the rest of my life and the idea of an oil refinery on the Sapit River turns my stomach. I'd like to explain why.

To begin with, this "debate" of "natives vs. outsiders" or "birds vs. jobs" is, in reality, nonexistent, a smokecreen created by lazy reporters and others who would evade the distasteful task of arguing the facts of the issue at hand. There are natives and outsiders on both sides of this issue. Pete Dorrence, the man who wants to build this refinery, may be many fine things but a "good old boy" from Georgetown County he ain't. I don't know about y'all, but I've never run into him out at North Inlet. Even if he was a native son, even if some environmentalists who oppose the refinery are outsiders, neither his nor their origins or locations matter. The point is that Winyah Bay is a regional and national treasure and any citizen of the United States has a right to an opinion on this issue along with a right to have their opinion judged by the validity of their arguments, not by the location of their residence. The salient fact about this "native vs. outsider" pseudo-issue is that at a well publicized public hearing the people who cared enough to show up voted 93 to 26 against a refinery in Georgetown.

Their reason for this smokecreen of "birds vs. jobs" is to avoid facing a few hard facts. The Environmental Impact Statement, for all its failings and gaps, did contain some pretty scary conclusions. With a refinery our town would be a dirtier place to live. The air would have 4 times as many hydrocarbons in it as it does now. Hydrocarbons cause cancer. A refinery would destroy the Sapit River as a brackish water nursery. Pollution from the refinery would end Friendship Plantation as a 259 acre waterfowl area. Fewer fish would be caught in Winyah Bay. Ducks would die from swallowing pollutants. Chronic pollution of Sapit River sediment would be with us for years to come. All of this would occur from normal refinery operations, not as the result of any big oil spill. With oil spills as a possibility we need to consider what

our bay would be like after one occurred. The consequences would range from pretty bad to catastrophic. A mistake could very well happen that we and our children would have to live with for a long time.

Some facts need to be faced. If this refinery location here we will have to say goodbye to a few things we won't take for granted. We won't fish near the new city park at the boulevard because if we did catch anything there we had better not eat it. We can say goodbye to some more ducks. There won't be as much marshland and all that it produces. And lastly, with 4 times as much environmental air pollution, we'd better get ready to say goodbye to a few more of us.

There is a full page color aerial photograph of Winyah Bay in the Environmental Impact Statement. It's a beautiful thing and a sight to behold. A friend of mine said that it made the Bay look like a huge organism. That's well put. Winyah Bay is a huge organism. The Bay doesn't need an open scar of a refinery polluting its bloodstream. It might not recover.

Sincerely,

Ken Stouffer  
411 Front St.  
Georgetown,  
S.C.  
29460

**(C/N||B)**  
**The Conway National Bank**

May 9, 1984

Mr. John L. Carothers  
U. S. Army Corps of Engineers  
Charleston District  
P. O. Box 919  
Charleston, South Carolina 29402

Re: Environmental Impact Statement  
Permit Application by  
Carolina Refining and Distributing Company

Dear Mr. Carothers:

Professionally and personally I have followed this permit application since inception. I testified in court pertaining to a law suit between the South Carolina Coastal Council and the South Carolina Wildlife Federation and have attended two of the corps' public hearings, the most recent being April 26, 1984. Please note the following:

1. I do not understand why everyone that is against this permit is labeled as an "environmentalist." Many of the fine, concerned citizens I know who are against this permit are outstanding leaders of their business communities, representing all walks of life.
2. I am disturbed that apparently you or your office are overlooking the professional study results of the U. S. Fish and Wildlife Service and the Environmental Protection Agency.
3. I am well aware that financial institutions are the nuclei of their business communities and are largely responsible for their economic life and growth accordingly. Please be advised that Carolina Refining and Distributing Company has been unable to obtain local financing for this project. In fact, according to a recent news quote, Mr. Dorrance stated that he had obtained his bank financing for his similar Savannah, Georgia project from the West Coast.....this alone should tell you something.

page 2

4. Being fully aware of protocol, I am concerned with the weight of your recommendation to Brigadier General Forrest T. Gay, III and find it hard to believe that General Gay would override your recommendation, and this disturbs me greatly.

In summary, I am requesting that because of professional and moral ethics, this permit request be unrevokingly denied. Please do not let any self-interest political influence disrupt a just decision.

Sincerely,

*A. Mitchell Godwin*  
A. Mitchell Godwin  
Assistant Vice President

AMG:jmr

cc: Brigadier General Forrest T. Gay, III  
U. S. Army Corps of Engineers  
510 Title Building  
30 Prior Street, S. W.  
Atlanta, Georgia 30303

30.374 1 Bay St.

Georgetown, S.C. 29400

May 9, 1984

U.S. Army Engineers District "Charleston"

Corps of Engineers

P.O. Box 919

Charleston, S.C. 29402

Dear Sir:

As a life long resident of Georgetown, I have shattered many boats, and am familiar with the waters and area surrounding Henigah Bay. The body of water, and the river and creeks that feed into it, are the prime source for thousands of shrimp, fish, crabs and oysters from which commercial fishermen make their living and residents and tourists enjoy for recreational purposes. Any industry with the potential to add to the present kind of pollution in any way would be a detriment. Therefore I would like to go on record as being opposed to the Canale Oil Refinery.

Sincerely,  
Capt. Sam B. Arrington, Jr.

LYNN ROSEN  
MILITARY ROSEN  
JACK M. SCOVILLE JR

LYNN ROSEN  
MILITARY ROSEN  
JACK M. SCOVILLE JR

May 18, 1984

Mr. John L. Carothers  
U. S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, SC 29402

re: Carolina Refining and Distributing Company

Dear Mr. Carothers:

I would like to express my opposition to the Corps' issuance of a permit to the Carolina Refining and Distributing Company. After reviewing the Draft Environmental Impact Statement, I have reached the conclusion that the detrimental effects of a refinery in Georgetown County, South Carolina, greatly outweigh any benefits that might be derived. I am particularly concerned with the air pollution that an oil refinery would produce in Georgetown. As you are already well aware, we have a paper mill and a steel mill in Georgetown. Even a minor increase in the amount of air pollution by the refinery will make living in Georgetown intolerable.

We have been so poor in Georgetown for so long that many of our citizens have become afflicted with tunnel vision in regards to development of Georgetown. The building of this refinery will be a mistake just like the building of the steel mill at its present location was a mistake. However, once it is in place, there will be nothing that we will be able to do about it.

I strongly urge you to deny Carolina Refining and Distributing Company its permit.

Sincerely yours,

Jack M. Scoville, Jr.  
Jack M. Scoville, Jr.

JMSjr:nlr

TELEPHONE  
546-4131  
546-4132



May 24, 1960

Dear Mr. Cruise,

Time is running out and a decision must be reached. The EIS is explicit, so I need not reiterate what has already been written. The damage is going to be significant, should the proposed refinery be built.

Mr. Clarence Cortezale that withdrew the merely "middle age ladies in tennis shoes." "Am a catholic school teacher but cannot afford, past time for business and is mother. My mission is to mechanize."

Engineer with some California Engineering and Surveying, Inc. His specialty is environmental pollution control. Our family has chosen to live in Mc Clellanville on the edge of the Cape Roman Wildlife Refuge - one of the few truly pristine areas left in our state. And we oppose the oil refinery.

Dr. Anthony James Porter grew up on his father's plantation on the Mississippi River. Since recent times the Porters have been protest defendants whose responsibility it was to "Keep out the bad. Let in the good."

It seems that the at all  
outpost of the has fallen to  
you the Pioneer. If you grant  
the wealthy the license for  
perpetual to perpetuate under the  
impact you will most certainly  
get a great on the back But  
the glory will be for feeling.  
Like Army Corps of Engineers holds  
the key to the future of  
Winyah Bay and surrounding  
Cape Roman National Wildlife Refuge.  
I shared it with!

— certainly some  
Cape Roman National Wildlife Refuge

District Engineer, Charleston District  
U.S. Army Corps of Engineers  
Attn: SACEN-E  
P.O. Box 919  
Charleston, S.C. 29402

Dear Sirs,

The proposed Georgetown Oil Refinery project is one which I am very interested in. I have been a citizen of South Carolina all of my life, and am concerned about the preservation of the fine natural resources our state has to offer. These natural productive areas are the primary attraction of our state, and their delicate nature must be preserved for environmental and economic reasons.

Primarily, the Georgetown Oil Refinery would no doubt be detrimental to the estuarine ecology of Winyah Bay, the Sampit River, and the surrounding areas. The purpose of the Environmental Impact Statement was to determine the extent of that impact.

Estuarine ecosystems are the most productive in the world, and support many marine species. Effluent discharge to these areas will have adverse impacts on the ecology of Winyah Bay, mainly by affecting the breeding areas and necessary basic elements of the food chain. Releases of oil and grease are cumulative over time, and will adversely affect the sediment content of the aquatic ecosystem. Since the sediment is the primary food source for much aquatic life, reduction of its quality will affect species higher up the food chain. Such discharge on the smallest of scales is toxic to marine life, and will eventually affect those of us that eat seafood.

The effects of an oil spill of any size is not acceptable to the South Carolina coastal environment. Justification of the construction of an oil refinery on any basis will seem moot upon that first spill. An oil spill could affect our coast ranging from the immediate area as far as Cape Roman National Wildlife Refuge. An adjoining area, 60,000 acres, is set aside for the unique

opportunity to study our coastal environment, necessitating preservation of it's natural state. Release of toxic substances is questionable; an oil spill would be disastrous.

Winyah Bay and the surrounding area are beneficial to our commercial fishing needs on a far greater basis than the need for refining oil in a South Carolina port. The jobs created by the project would be only temporary construction jobs, and the small staff for the refinery would not employ unskilled labor, the major need in that area. Professionals would probably come from outside the state. Loss of employment from the commercial fishing industry would be overwhelming in the event of an oil spill, and the quality of catch is bound to decline due to the cumulative effects on the aquatic habitat. The established fishing industry is of greater importance in terms of economic gains for our state.

Permitting the Carolina Refining Distributing Company refinery requires full input and evaluation from the involved agencies. Implications defined by the U.S. Fish and Wildlife Service concerning effects on the delicate marine ecosystem are of primary importance. The 401 certification by The Department of Health and Environmental Control, for construction of a pipeline only, should not affect the decision process on certification of actual refinery operations. Certification can not occur with assumed compliance, or probable granting of necessary permits.

This proposal by the CRDC apparently has more potential adverse effects in terms of environmental quality, consequently affecting South Carolina's natural resources and the diverse benefits they provide. Short term economic gains are questionable when viewed in terms of what this proposal provides for the people of the State of South Carolina.

Sincerely,

*John S. Wilson*

John S. Wilson  
May 22, 1984

May 23, 1984

The District Engineer  
U.S. Army Corps of Engineers  
Box 919  
Charleston, SC 29402

Dear Sir:

I am writing regarding the proposed construction of the oil refinery near Georgetown on the Sumpter River. The 130 or so jobs that this refinery will create are not worth the further pollution of Winyah Bay. The further pollution of the bay will challenge many more than 130 already existing jobs in Georgetown County in water related fields, such as fishing, recreation and marine biology. In addition, a good number of the proposed 130 jobs with the refinery will be filled with qualified personnel outside of Georgetown County.

You need only look to the Delaware and Chesapeake Bays to see what affects a lack of vigilance can have on a productive body of water. There will be run-off and there will be spills from a refinery in Georgetown. If there exists a possibility of these happening, then we must accept the responsibility that they will. Whatever the expedient, short-term goals and special interests this

Box 66, Route 1  
McClellanville  
S.C. 29458

District Engineer  
U. S. Army Engineer District,  
ATTN: SACEM-E  
Post Office Box 919  
Charleston, S.C. 29402

May 23, 1984

Dear Sirs:

The Environmental Impact Statement for <sup>the</sup> proposed Carolina Refinery in Georgetown has confirmed our worst fears. I hope that in deciding whether to allow the refinery to be constructed the Corps of Engineers will consider carefully the wishes of the people of McClellanville. I know without a doubt the overwhelming majority oppose this project. I believe this is also true of the people of Georgetown but, not living there, I cannot speak from first-hand experience. If they all do not write you it is because they have so little hope of influencing governmental decisions.

The refinery offers a few dozen jobs and threatens the living of hundreds. I also fear that favorable ruling on the refinery would be a foot in the door for a type of industry that could eventually destroy a way of life. Most people native to this region have lived here through economic hard times because they love the place as it is. Others have been drawn here by the research institutes, the refugees, the GMA's, the birds, the water.

According to the EIS, the refinery and the type of industry it might attract endangers all this. Other less-polluting industries are possible. We don't need this one. The refinery supposedly will create one hundred jobs directly and forty more indirectly. It is not fair for the sake of these few jobs to take so much from so many.

Yours sincerely,  
*Susan Hoffman*  
Susan Hoffman

2

proposed oil refinery seems, they are not worth, economically speaking, the eventual long-term result of the devastation of part of South Carolina already dwindling, precious natural resource — her very rich and productive coastline of estuarine bays, marshlands and river deltas.

It makes sense to take care of what we've got.

Sincerely,

Virginia Christian Beach  
683 Folly Rd.  
Charleston, SC 29412

May 23, 1984

District Engineer  
U.S. Army Engineer District, Charleston  
Attn: SACEN-E  
P.O. Box 919  
Charleston, S.C. 29402

Dear Sirs,

Having studied the Draft Environmental Impact Statement for the permit application of Carolina Refining and Distributing Company for construction of a refinery on the Santee River and installation of two underwater pipelines to the proposed refinery, I have concluded that issuance of any permit for the above named projects would be a terrible injustice to Georgetown and the area marsh lands. As anyone could understand the environmental dangers and also realize the economic damage likely to occur due to the loss of fishery related jobs, your office as well must see these two major factors as reasons for not supporting this project.

My home is on the marsh just south of the Santee River and directly behind Cape Island. As a biologist, I have spent many days in the marshland area and know it well. It could not withstand the polluting effects from the daily discharge much less a major oil spill. Cape Romain Wildlife Refuge, the Santee Delta and Marsh Bay are vital areas to sea and shore birds, sport and commercial fishing, shellfish and crabs as well as providing recreational areas. No such industry should be allowed to locate in an area where it would threaten these water and marshland habitats.

I urge you to make the decision that you know is right and not issue a permit to Carolina Refining for pipelines or construction of a refinery.

Sincerely,

*William Youngman*  
William Youngman

May 23, 1984  
P.O. Box 665  
Pawleys Island, S.C.  
29981

Mr. John L. Carothers  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, S.C. 29402

Dear Mr. Carothers:

We have been residents and homeowners in Georgetown County for the last twelve years. We are both employed in the teaching profession. A significant portion of our income is also derived from the tourist industry on the Waccamaw Neck.

We both wish to go on record as strongly opposing the proposed oil refinery at Georgetown. We seriously question its overall value to the community when considering those benefits that may be lost or reduced due to its operation.

We hope that your decision is to deny any necessary permits that would enable the construction of this proposed refinery.

*Claudia K. Insley*  
Robert D. Insley

Claudia K. Insley

453-A Howde Ave  
Char, SC 29412

May 24, 1984

District Engineer  
U.S. Army Engineer District,  
Charleston  
P.O. Box 919  
Charleston, SC 29402

Dear Sir:

We have reviewed the draft Environmental Impact Statement for the permit application of Carolina Refining and Distributing Company. After reading the EIS, we are convinced that normal day-to-day operations will cause considerable pollution in Winyah Bay. Considering that Winyah Bay is one of the most pristine estuarine areas left on the east coast, an oil spill causing it to be closed for commercial and recreational fishing would be a true disaster.

I am strongly opposed to this refinery, and I urge you to deny this permit.

Sincerely yours,  
Christine P. Roubik  
Treasurer, Winyah Bay  
Sierra Club

291 East Bay Street  
Charleston, SC 29401

May 24, 1984

District Engineer  
U.S. Army Engineer District,  
Charleston  
Post Office Box 919  
Charleston, South Carolina 29402

Dear Sir:

We have reviewed the draft Environmental Impact Statement for the permit application of Carolina Refining and Distributing Company.

The EIS convinces us that there will be a substantial amount of pollution in Winyah Bay due to the normal day-to-day operations of the proposed refinery. In addition, Winyah Bay, in the event of even a medium sized oil spill, would have to be closed to commercial and recreational fishing, crabbing and shrimping for many years, which creates an unacceptable risk by causing the displacement of the many hundreds of people relying directly and indirectly on the Winyah Bay fishery for a living.

I urge you to deny the permit.

With kindest regards, I remain

Yours very truly,

Robert G. Clawson, Jr.

Robert G. Clawson, Jr.  
Chair, Lantz Group  
Sierra Club

RC/vnl

9511 Old Georgetown Highway  
McClellanville  
South Carolina, 29458

District Engineer  
U. S. Army Engineer District,  
ATTN: SACEN-E  
Post Office Box 919  
Charleston, South Carolina 29402

May 24, 1984

Dear Sirs:

I heard there was a project for a refinery in the Georgetown area a year ago. At the time my reaction was to smile and say to myself, well that is not going to happen. I am a woodworker in McClellanville and one may wonder why I had such a strong immediate opinion about something so remote from my daily life. But the truth is such a project is not remote from the lives of anyone living in this area. Anyone spending any length of time in Georgetown must be sensitive to air quality and feel upset that a highly polluting industry would move in just as relief from the paper mill stench was in sight. And more important still, anyone living here must care for the cleanliness of the water. The Winyah Bay fisherman, the McClellanville crabber or shrimp, the paper mill worker who goes fishing at Cape Roman on the week-end, the Charleston executive who comes duck hunting, the scientists who study the bountiful marsh ecosystem,

the wildlife lovers who go bird-watching in the numerous reserves, the restaurant owner, who wish for more tourists to visit, the families who want to enjoy the beaches and the seafood, we all know the importance of the water in our lives even if we haven't all stopped and considered that unless we are careful we can ruin it or let it be ruined. The water quality is far from perfect now - for instance the shellfish at Pawley's Island has been polluted for years- so we certainly cannot afford to let it get worse.

This all rushed through my mind as I first heard of the project. Then a week ago I got a copy of the Environmental Impact Statement. I learned a lot from it and it considerably strengthened my original opinion that Georgetown was a very wrong place for a refinery. I worried about the air, but I didn't know that the sulfur dioxide the refinery emitted would bring its level to the maximum permitted under the Clean Air Act. (VII A-30) I worried about the pollutants discharged in the Sumpit but I didn't know the consequences as described on VII C-37, nor did I realize that tidal flats and salt marshes which constitute 80% of the Winyah Bay system suffer worse damage from oil spills than any other environment (VII C-54). But the fact that surprised me most of all is that the Charleston District seems to remain in favor of the project. I do not understand this and I hope the wishes of the majority of residents of the area will not be forgotten when the time for the final decision comes.

Sincerely,  
*Nora Manheim*  
Nora Manheim

25 MAY 1984

Frederick W. Moxley  
400 Helena Street  
Georgetown, S.C. 29402

May 4, 1984

Dept. of the Army  
Corps of Engineers  
P.O. Box 913  
Charleston, S.C. 29402

Dear Sir:

At the recent hearing for the Georgetown Oil Refinery project, a young man who described himself as an expert in oil spills and told of the various areas he had been called to for oil clean up, gave what I thought was one of the best arguments against building an oil refinery in Winyah Bay area.

I retired to this area five years ago and do spend a lot of time on Winyah Bay, exploring all the creeks and estuaries and I am very familiar with the area.

I am convinced that with the strong water currents in the bay, it would not be possible to use a "boom" to contain an oil spill. Also the large area to the north of the main channel known as "Tiddy Bay", is very shallow, so shallow that most of the area at low tide I cannot get to with my small outboard. Any oil spill that entered this large space, with the strong currents, would be impossible to contain before it spread out into the main grass.

In all my travels up and down the east, there is no coastal area like Winyah Bay that remains unspoiled by man.

I urge you not to allow an Oil Refinery to be built in Georgetown.

Very truly yours,

*Frederick W. Moxley*  
Frederick W. Moxley

P.O. Box 561

MS Clallamville, S.C.  
29458

May 24 1984

Mr. John L. Carothers  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, S.C. 29402

Dear Sir:

As a small time commercial fisherman I would like to express my concern about the proposed oil Refinery in Georgetown. I have not read the entire environmental impact statement but in scanning it I have determined that the economic benefits are slight especially when amount of damage that could be caused should some mishap occur. That is not a likely occurrence but nonetheless the results would be devastating.

There are tremendous pressures being brought to bear on the fragile coastal areas of the United States. South Carolina needs to preserve its remaining estuaries and marshlands and take every precaution against the type of



damage that could occur with an industry of this type.

The economic gains would apply to a very few but the consequence of a mishap would apply to us all.

Thank you for the opportunity to express my views -

Yours truly,

Thomas A. Citterdale

May 25, 1984

District Engineer  
U.S. Army Engineer District, Charleston  
Attn: SA CEN-E  
P.O. Box 919  
Charleston, S.C. 29402

Sir,

Carolina Refining and Distributing Co. should not be permitted to install two underwater pipelines across the Sumpit River in Georgetown S.C.

The harmful effects of such a project far outweigh any economic gains for the Georgetown area. High sulfur dioxide emission levels and the tremendous quantities of hydrocarbons in the effluent would put further serious burden on an area already saturated with "dirty" industries. Oil spill control equipment is neither locally available, nor are properly trained individuals immediately available in the case of a serious spill.

From available data it is obvious that

(2)

an operation the size of the one proposed by Carolina Refining and Distribution Co. is economically unfeasible, and therefore, it must be concluded that as soon as the proposed pipeline are in place, an expansion of the refinery could be expected, magnifying all the adverse effects.

Finally, and worst of all, is the possibility of a major oil spill in Winyah Bay or immediately offshore. South Carolina's coastal wetlands are one of its greatest treasures, and they constitute a very delicate ecosystem. Such a spill would in effect kill Winyah Bay, Hobcaw Barony, North Island, South Island, The Santee Delta, The Santee Coastal Reserve and The Cape Romain Wildlife Refuge for years. These areas are the habitat and feeding grounds of a huge portion of Atlantic Flyway migratory waterfowl, the site of a large and economically important shellfish industry, and the breeding grounds

(3)

for many commercially and recreationally important fish species and shrimp and blue crabs.  
Say no to the pipelines.

Thank you,

Thomas W. Parker III


Rt 1, Box 126

McClellanville, S.C.

29458

H. P. WORRELL D.D.S.  
P.O. BOX 1143  
1314 NORTH MAIN STREET  
MARION, SOUTH CAROLINA 29571  
TELEPHONE 423 4611

May 25, 1984

BOSTON  Red Sox

FINNEY PARK BOSTON MASSACHUSETTS 02215

May 25, 1984

Colonel Lee Smith  
U.S. Army Corps of Engineers  
Charleston District  
P.O. Box 919  
Charleston, S.C. 29402

Re: Draft Environmental Impact Statement & Permit Application by  
Carolina Refining and Distributing Company, Georgetown, S.C.

Dear Colonel Smith:

The U.S. Army Corps of Engineers is to be commended for the method and thoroughness of the EIS preparation on the proposed Georgetown Oil Refinery.

Based on personal knowledge of the area and after evaluating the Draft EIS and comparing the potential significant adverse impacts on Winyah Bay estuary system to the potential benefits of the project, I sincerely believe that the greater public interest and need would best be served by disapproving the project. I respectfully request that the U.S. Army Corps of Engineers permit be denied.

Sincerely yours,  
H.P. Worrell D.D.S.

Mr. John L. Carothers  
U. S. Army Corps of Engineers  
Charleston District  
P. O. Box 919  
Charleston, South Carolina 29402

Dear Mr. Carothers:

I am personally responding to the "Draft Environmental Impact Statement for Oil Refinery, Georgetown, South Carolina". I wish to commend you for the comprehensive and wide-ranging approach which you used in the evaluation of the impacts resulting from the operation of the refinery.

As you may know, the Yawkey family has been a significant land owner of property in the Winyah Bay area since the very early part of the century. My husband, Tom, spent his childhood on South Island and was an avid outdoorsman with a keen respect for nature and wildlife.

In 1976 Tom bequeathed a 20,000 acre wildlife refuge on North Island, South Island and Cat Island to the State of South Carolina, while at the same time establishing a significant endowment fund for the maintenance and preservation of that property.

The draft report clearly and emphatically points out that there are unique and highly valuable natural assets in Winyah Bay and that these resources are already "stressed" by existing pollution. The many and varied agencies which participated in the study may have had divergent views on the types of impacts resulting from the refinery operations, yet one common thread prevailed through all their conclusions, namely, that severe and extensive adverse impacts would result to the natural resources in the area, not only from a "probable" oil spill but from the events that will definitely occur, i.e. the chronic and consistent discharge of pollutants into the air and water.

Accordingly, I find it unconscionable that anyone would permit further substantial risk to the resources of Winyah Bay, when it is apparent alternative sites are available to the applicants if they simply gave such sites fair and objective consideration. The evidence

Mr. John L. Carothers

-2-

May 25, 1984

In your draft report on the adverse impact is overwhelming, and is sufficiently conclusive to call for a denial of the permit for the Harmony Plantation and Myrtle Grove sites.

Sincerely,

*Jean R. Hawkey*  
Jean R. Hawkey

/pb

# Wingah Senior High School

1200 HIGHMARKET STREET  
GEORGETOWN, S.C.  
29440



WAYNE P. TAYLOR, PRINCIPAL  
Telephone 546-2441

MRS. ANNA D. KELLY, ASSISTANT PRINCIPAL  
Telephone 546-2442

ROBERT E. MEDALE, ASSISTANT PRINCIPAL  
Telephone 527-1534

MRS. ROSALIE WILLIAMS, GUIDANCE DIRECTOR  
Telephone 546-2443

JOSEPH T. DEAC, JR., ATHLETIC DIRECTOR  
Telephone 546-1172

May 25, 1984

Dear Mr. Carothers,

I am an English teacher at Wingah, and my husband has his own real estate company and he's doing crawfish farming also. We intend to make Georgetown our permanent home.

Although I realize Georgetown is economically depressed, I also realize the immeasurable value of the salt marshes in our county. My father works for International Paper Company and ~~fully~~ fully realizes how important ~~to~~ <sup>to our</sup> economy is to us. But is the economy more important than the ecological systems which could be damaged or destroyed, and can never be replaced? No money can buy back a salt marsh, when it's been destroyed by an oil spill that

wasn't supposed to happen.  
 Last summer my Elderson and I took a class through Saruck Institute called "Learning About Nature With Your Child." During that week I learned to appreciate all the beauty in nature (forests, wet marshes, bogs, etc.) that we have available to us in Georgetown County. I don't want to see it destroyed.

I am against the installation of any underwater pipelines across the Sampit River by Carolina Pipeline and Distributing Company or any other company of that nature.

Thank you,  
 Martha P. Shette

P.S. Please send me a copy of the booklet: Environmental Impact Statement

5/26/84

Dear Sirs,

I have reviewed the draft of the Environmental Impact Statement (EIS) for the proposed oil refinery on the Sampit River in Georgetown, S. C. and would like to comment on the pending request for issuance of permit(s) for such a refinery.

The draft of the EIS is impressive in its scope and alarming in its conclusions. The coastline from North Inlet southward, including Hobcaw Barony and the Belle W. Baruch Institutes, Tom Yawkey Wildlife Center on North Island, Winyah Bay, the Pee Dee, Waccamaw, and Sampit Rivers, Samworth Game Management Area, Cat Island, South Island, the Santee Coastal Reserve, the Santee Delta and Cape Romain Refuge constitute a resource for South Carolina and the nation whose value cannot be overestimated. It is unique. These marshes and wetlands and estuaries are among the most productive ecosystems in the world. In view of the rapid rate of decline of such systems along the east coast of the United States the marine life and waterfowl of the Atlantic coast are becoming increasingly dependent on those areas which can still support them. In addition this area has gained international attention and respect as a unique system for the research and study of wildlife and marine ecology. The value of many of the facilities in the immediate impacted area would be seriously compromised should the relative pristine nature of the area be lost. The EIS leaves no doubt but that such destruction of the environment would occur!

Specifically:

Section VII C 18-23 and Section VII C 56-58 These sections are among the most alarming of the entire EIS. They describe the expected and unavoidable effects of routine day to day operation of a refinery under the best of conditions. These effects alone vastly outweigh any possible benefits by a overwhelming margin. Such devastation would undercut the area's richest economic resources, the recreational and commercial use of the waterways and marshlands and the aesthetic value of the area for tourism and other non-polluting development.

Section VI B This section makes clear the expected sulfur dioxide levels will increase significantly, endangering waterfowl nesting areas and other sensitive sites in the area (VI B-12). In addition maximal allowances for sulfur dioxide would be consumed or exceeded, ruling out other potential industrial development in the area.

Section VII C 23-50 This section reads like a nightmare in its description of hypothetical oil spill scenarios. We must keep in mind that these are conservative estimates of the quantity of oil spilled and resulting damage.

In short, the conclusions of this EIS make it perfectly clear that issuance of such permits is not in the best interest of the people of Georgetown County, or of South Carolina. Indeed, to trade the vast resources of this unique area for a few paychecks (a very few) will most certainly be viewed with horror, resentment and disbelief by future generations whose inheritance will have been squandered and lost forever.

Please, let sanity prevail.

*Michael R. Bigelow*

Michael R. Bigelow  
 P.O. box 9 McClellanville, S. C. 29458

# Carolina Consultants

May 26, 1984

Dear Mr. Matthews,

We have reviewed the environmental impact statement on the proposed oil refinery in Georgetown.

We would like to take this opportunity to express our strongest disapproval of that project.

The possibility of an oil spill could be devastating to this area - not merely in terms of wildlife - not to mention the increased risk of hurricanes.

We do not believe this company has the resources or the ability to handle the potential risk.



P.O. Box 295 • McClellanville, S.C. 29458 • (803) 887-3231

Box 126  
McClellanville, S.C.  
May 26, 1984

U.S. Army Engineer District  
PO Box 919  
Charleston, S.C.

To Whom It May Concern:

I would like to register my opinion concerning the proposed oil refinery in Georgetown. I am very strongly opposed to allowing the refinery to be built. The polluting effect could add an unbearable load on an already precarious environment. The potential for an oil spill along this coast negates any possible benefits that the refinery would provide.

Because of the environmentally threatening nature of this industry, I ask that you deny any permits for its construction.

Very truly yours,  
Sara S. Golen

The Wedge Plantation  
McClellanville  
South Carolina 29458  
27th May 1984

Mr. John L. Carrothers  
U.S. Army Corps of Engineers  
Charleston District  
Charleston, S.C.

Dear Mr. Carrothers:

I've read the Environmental Impact Statement concerning the proposed Oil Refinery for Winyah Bay.

I'm shocked to think that you could even consider the construction of a refinery that, while providing enrichment for a handful of people who have no connections with our State, could devastate a substantial portion of our valuable and extremely fragile coast. An area that is vital to wildlife and that provides a means of livelihood for local residents. An area that is, above all, irreplaceable.

A refinery would perhaps employ a few people, but hundreds more depend on the area as it is now. PLEASE DO NOT ALLOW THIS REFINERY TO HAPPEN. We must struggle to save this area from the ravages of the financially powerful. Do you imagine God created it to have it suffocated by oil slicks? I urge you to reconsider and reject this proposal.

Sincerely,

*Stephanie Waldron*

Stephanie Waldron  
The Wedge Plantation  
McClellanville, SC

May 27, 1984

District Engineer  
U.S. Army Engineer District, Charleston  
Attn: SACSA-E  
P.O. Box 21,  
Charleston, S.C. 29402

Dear Sir:

After reading the Draft Environmental Impact Statement concerning the permit application of Carolina Refining and Distributing Company, I implore you not to issue a permit for the installation of underground pipe lines to the proposed oil refinery on the Sumit River. I find it absurd at least to add any amount more to the pollution of the Sumit River and Winyah Bay. The stupidity becomes monstrous when the possibility of an oil spill is realized. In the event of such an accident, the damage is much too widespread. More people in the area from Georgetown through McClellanville depend for a living on healthy marsh lands, salt crabs, and bays than the economic reasoning for the construction of this project justifies.

Please don't allow the establishment of such a potential disaster by issuing the necessary permit.

Sincerely,

*Lane Youngman*  
Lane Youngman

P. O. Box 397  
McClellanville, S. C. 29458  
2nd of May 1984

District Engineer  
U. S. Army Engineer District, Charleston  
ATTN: SACEN-E  
P. O. Box 910  
Charleston, S. C. 29402

Dear Sir:

I have just read the Draft Environmental Impact Statement for the proposed oil refinery in Georgetown. I understand the permit for this refinery comes directly from your office. Since the Corps of Engineers put together this amazing EIS document, showing what destruction on marine-life and wildlife a refinery would do - even under the best of circumstances - surely a permit could not be forthcoming.

One positive reason for the refinery was pointed out. Georgetown, being an economically depressed area, could have approximately fifty more jobs available. The hall leading to the employment office of such a refinery would have to be very long to accommodate the fishermen and shrimpers looking for jobs after their livelihoods have been ruined.

Please do not even consider a permit for this highly polluting industry. Our coastline is far too precious and the Cape Romain Wildlife Refuge is much too close. The risk is too great.

Sincerely,

*Margaret Bissell*  
Margaret Bissell Fulcher

Dear Sir:

I oppose an oil refinery in Georgetown by these reasons  
to be a oil spill it would ruin all the animals in the  
ecosystem.

There is a small creek and it is not worth it  
to be ruined. It is out to the beach and the surrounding  
area is a very valuable area, including, including, including,  
including, and including many other things.

It would really be a disaster if all this was ruined  
for everyone.

Sincerely,  
Rufus C. Buchanan  
R11 Box 126  
McClellanville SC  
29458



## GLOSSARY

AAM - Annual Arithmetic Mean  
AGM - Annual Geometric Mean  
API - American Petroleum Institute  
BAT - Best Available Technology  
BATEA - Best Available Technology Economically Achievable  
BCT - Best Conventional Pollutant Control Technology  
BOD - Biochemical Oxygen Demand  
BPD - Barrels Per Day  
CEQ - Council on Environmental Quality  
CO - Carbon Monoxide  
COD - Chemical Oxygen Demand  
CRDC - Carolina Refining and Distributing Company  
CVC - Commercial Vessel Casualty  
DHEC - Department of Health and Environmental Control  
DWT - Dead Weight Tons  
EPA - Environmental Protection Agency  
mg/l - milligrams per liter  
HC - Nonmethane Hydrocarbons  
HF - Gaseous Fluorides  
H<sub>2</sub>S - Hydrogen Sulfide  
IMCO - International Maritime Consultative Organization  
IPC - International Paper Company  
ISCLT - Industrial Source Complex Long Term Computer Model  
LTTL - Less Than Total Loss  
μg/m<sup>3</sup> - Micrograms Per Cubic Meter  
MPS - Most Probable Spill  
NAAQS - National Ambient Air Quality Standards  
NAMS - National Air Monitoring Station  
NMFS - National Marine Fishery Service  
NO<sub>x</sub> - Oxides of Nitrogen  
O<sub>3</sub> - Ozone  
OSHA - Occupational Safety and Health Administration  
PAHs - Polynuclear Aromatic Hydrocarbons  
Pb - Lead  
PEL - Permissible Exposure Limits  
PCB's - Polychlorinated Biphenyls  
POTW - Public Owned Treatment Works  
PPT - Parts Per Thousand  
PSD - Prevention of Significant Deterioration  
SCWMRD - South Carolina Wildlife and Marine Resources Department  
SIP - State Implementation Plan  
SLAMS - State and Local Air Monitoring Station  
SO<sub>3</sub> - Sulfurtrioxide  
SO<sub>2</sub> - Sulfur dioxide  
SPCC - Spill Prevention Control and Countermeasure Plan  
TL - Total Loss  
TRAM - Tanker Oil-spill Risk Assessment Model  
TSP - Total Suspended Particulate  
TSS - Total Suspended Solids  
VOC - Volatile Organic Compound  
WQI - Water Quality Index  
WSF's - Water Soluble Fractions  
WWTP - Waste Water Treatment Plant

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